

# This Old House

TM

A color photograph of two men, Steve and Norm, riding horses in a desert setting. Steve is on the left, wearing a light blue denim shirt and a white cowboy hat, holding a lasso. Norm is on the right, wearing a red and white plaid shirt and a tan cowboy hat. They are surrounded by cacti and a wooden fence post. The background shows rolling hills under a clear sky.

Steve and Norm  
ride into Tucson



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On the contents

第10章

in the same circles?

Table

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what's over the next hill?

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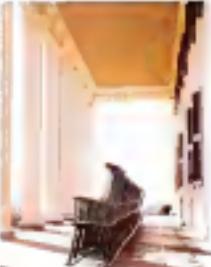
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By George, p. 79

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After two decades of putting off their remodeling dreams, a Tucson architectural designer and his wife jump at the chance to offer their 1932 Pueblo Revival house as the spring TV project. By Jack McEntee

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A swirl of earth and blue rock flourishes in a Malibu cool art installation with a 16-inch thick slab of solid adobe. For the age-old combination of sand, straw and water doesn't weather well. Adding a little lime-cement cement seal that allows an Arizona couple to finish a house that may last until the next millennium. By Reid Moretz

## Our Father's House

Whether leading his country into the muck of a war or fighting for the new Constitution, George Washington never forgot where he really was—an honored homeowner. The first of a new series on America's greatest houses. By Stephan Haveran

## Water is the Enemy

More than half of America's basement walls. This moist majority is only a short-time away from flooding, that can destroy major systems such as heating and air conditioning. No wonder waterproofing Dean Martensen is a popular pro. By Curtis Rau

## An American Craftsman

For models of a time, master locksmith Bob Givell imagined himself made an antique lock he has never opened, trying to "see" the brass and hardware and understand the methods of the original locksmith. Once he has figured it out, he can unlock the lock without destroying it. By Mark Hoenigman

## Microscopic Menace

Can *Stachybotrys* eat—out of dozens of molds that hide in moist houses—kill children? Learn why mold and mildew must be controlled and why newer homes are more dangerous than older ones. By James Bechtel

## The Poster: Moldings

Shaped strips of wood are crisp, gay motifs that bring cheer, depth and fun to walls for spaces. Rip out this month's poster to find a floor-tiling guide to the classic profiles of baseboard, chair rail, coving, crown and other moldings. By John Kelsay

## In the Garden

A classic greenhouse is reborn as a sun-filled addition. Russ Marash finds a surprising favorite among a yearfull of garden series, and Fay Doti looks at root cutters, carnivorous houseplants and more.

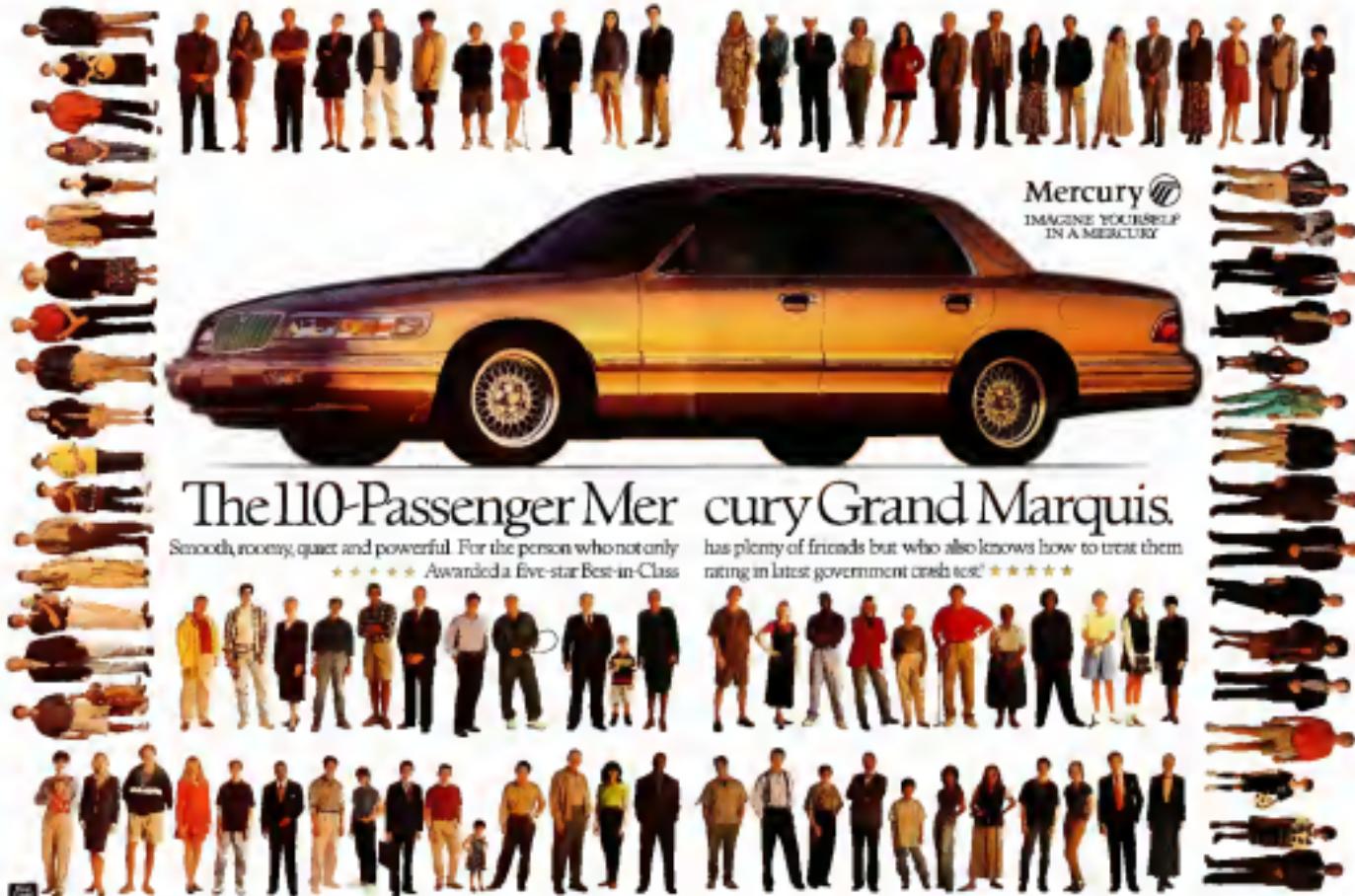


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On the cover: Norm and Stacie set through the Arizona desert on their way to the spring TV project. Photograph by Jim Berlin

(Continued on page 10)





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# up front

## ON THE WALL

### Plumb Crazy

Perhaps Lady Macbeth wasn't really mad, she was just in love with wallpaper steamer. By Jessie Marie Laskin

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PHOTOGRAPH BY JEFFREY L. BROWN FOR THE NEW YORK TIMES

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### Shingling Secrets

Follow the seven of orders and the sound of hammers will be a Newfoundland, where Norm shows the right way to ride a roof. By William G. Scheller

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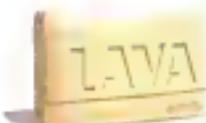
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Visit This Old House on the World Wide Web to read about our project houses, view articles online and get up-to-the-minute happenings nationwide for the user. [www.eweb.com/eweb/tolh/](http://www.eweb.com/eweb/tolh/)

*This girl, p. 28*

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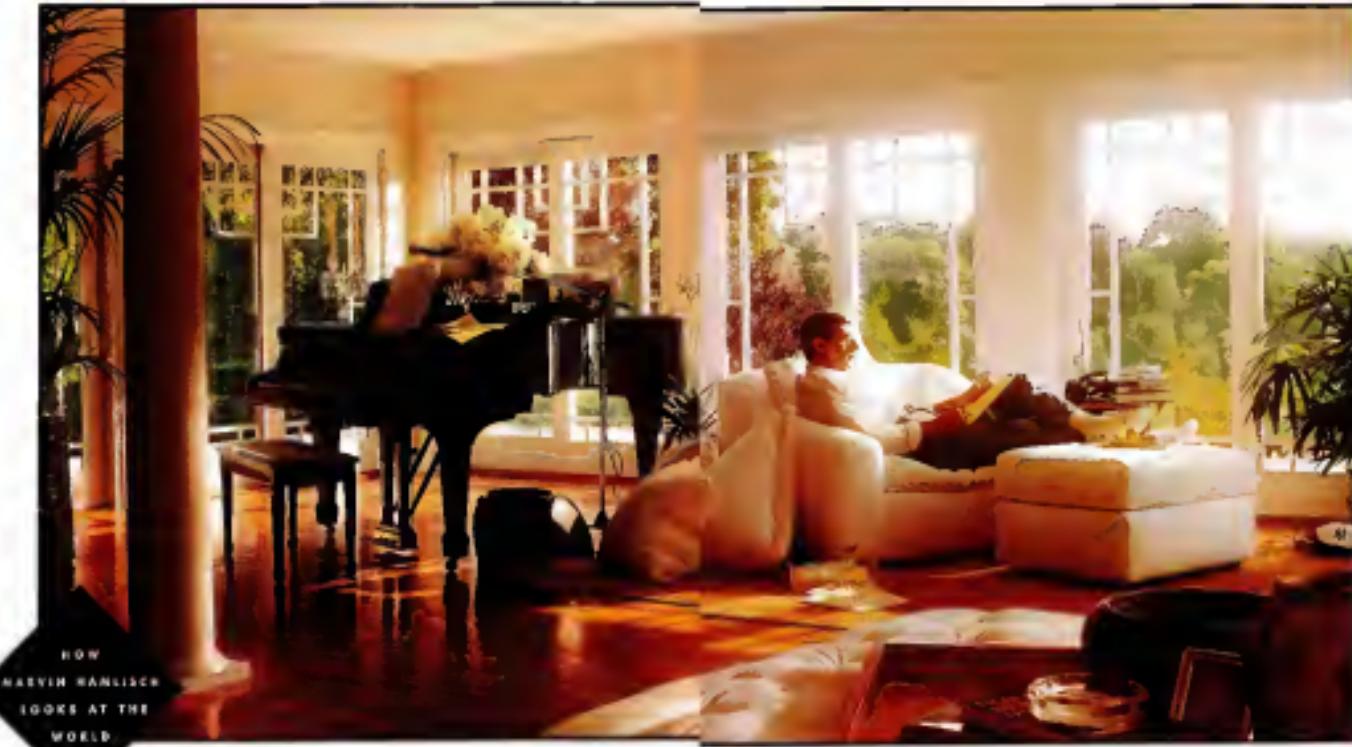
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*PHOTOGRAPH BY JEFFREY L. BROWN FOR THE NEW YORK TIMES***JENN-AIR**

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## contributors

#### As Tigr Oxf (Tigr's official correspondence)

**BROWNING INSTITUTE** researches and responds to all readers' questions and requests. The number one query: 'Will you research my house?' The basic memo: Do we have plans for a cluster, and does *Save* have a 'This Old House' issue? ('It doesn't, and it's about to!') **MICHAEL SLEEVIN** (photographer,



"Rating Actions") has shot covers for Time, Time  
Digest and U.S. News and World Report, and his photo  
documentaries have appeared in more than 20 magazines.  
Recently married and living at Los Angeles, he will accept  
book for publication to  
photograph while  
travel. Gordon born  
1930.

photographer **MICHAEL GRIMM** ("Stad Gunn") has been based in New York for 10 years. He has recently completed assignments in Provence along the west coast of Italy and in the towns of



unveiled a book and mounted an exhibition on English and American poets for the New York Public Library (86 Main, 21400, 214585@compuserve.com).

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# Letters

I am living your November/December oil-tank story ("The Peril of Oil Tanks"). In 1995, we discovered that nearly 300 gallons of oil had leaked out of our tank. We had to hire an environmental lawyer, a hydrogeologist and an expensive testing company. The clean-up itself was another \$40,000, and we still have no idea if any of it will be reimbursed. Moreover, the stress of it all was a factor in the breakup of my marriage. Now I always tell people to just get rid of their tanks.

Genia Wymbs  
Hart, MI

Writer Pat Terry says that stress played a huge role in her oil-tank experience too, and that your letter was a great reminder that while financial losses can be severe, the emotional damage can be even greater and more difficult to repair.

Your oil-tank article was thoughtful and informative, but we felt it necessary to point out that our company has the technology to clean old, dirty and gasoline in a fraction of the time to which you mentioned. Our bioenvironmental technique uses an oxygenation process that neutralizes hydrocarbons without combustion or consumption of approximately 1,000 liters.

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Environmental Company  
Tampa, Florida

Our coverage focused on the excavation and disposal of oil-contaminated soil—the most common cleanup method—for the EPA's Office of Underground Storage Tanks (OUST). We offer techniques that are more effective for certain conditions. The major problem with excavation is getting oxygen to anaerobic bacteria; even when oxygen is injected through pipes, bacteria can take months to years, and days and years can further slow the process. When soil or other conditions don't permit oxygen injection, other methods, such as oxidizing the bacteria, your company has developed, can speed up the reduction, but since no single treatment

is going to be appropriate for all soils, we recommend that homeowners hire a remediation company who knows about all the options, as well as a home test and can supply information on alternative techniques, including newer technologies such as radio-frequency heating and soil vapor, as available on the World Wide Web at <http://www.simpson.com/OUST>.



We loved your Northeast story ("A Door in Northeast," November/December), but you gotta know to spot the Colder. That story located in "Scooter" was in Massachusetts—get it?—  
John O'Neal  
Beverly, MA

Your letter got us on the phone to Sarah Macrae, an editorial assistant on the Northeast Superior and Midwest and a 15-year resident of Wisconsin. She assured us that the locutor was both fluent and knowledgable.



## In re November/December



In re November/December story on holiday lights ("It's the Lights That Matter"), you provide no example for determining the maximum number of lights that may be connected in a strand. Although your math is correct, you did not take into account the National Electric Code requirement (paragraph 210-20) that the load on a circuit must be limited to 80 percent of its breaker or fuse rating. The maximum allowable current on your 15-amp circuit should be 12 amps.

Philip G. Steiner  
Durham, CT

The four-inch hempeny wood block, shown in the top of page 21, cuts on the downstroke and is useful for laminating work. But Tom says he's "never been much of a dovetailing block guy." They're an easier to use, in my opinion, of pulling the saw into the material, they tend to just sit there, and you have to exert more pressure to keep the blade steady and prevent it from hopping up on the downstroke.

Thanks very much Dan Cook of Elgin, Illinois, and J. S. Tandy of Gainesville, Pennsylvania for the correction. Sorry to overstate the 80 percent rule; the possible weight on our example would be 14 amps or 212 watts = 1,284 watts. That would allow for up to 125 watt strings of 0.7 inches instead of the 15 we originally calculated.

Our 1000 houses is located by hot-water radiators. We would love to add central air-conditioning, but the framework—concrete blocks and horizontal joists—makes it difficult every 18 inches—makes installation expensive, if not impossible. What are our options?

Donald W. Hart  
Hart, MI

Richard Tschirhart, plumbing and heating specialist at The Old House, has a few suggestions. First of all, radiator supply lines in the upper floor is usually pretty easy. With the expansion and bleed installed in the same, as they often are (and with the condensate line installed on a common pipe), there for top-floor radiators are simply too far to regulate or to change off those rooms. The easier challenge is getting them to the lower ones. Whether possible, consider one floor down through the length of eaves and, for basement runs, through your curtain. Those rooms don't work, a short duct can be built with insulated metal framing. Opening up a wall cavity to create a floor joist and only add it would be for our two-deck room.

If a standard system will prove installation problems, then an air couple of alternatives.

The easier is a high-vacuum system, in which coil air is distributed through flexible, insulated two-inch ducts to small round outlets cut into walls, floors or ceilings. The small-diameter ducts make for a somewhat less invasive installation. (See the January/February 1998 article "Central Control," for how such a system was used in the Savers project.) Another possibility is spot cooling your house with a split system air conditioner. The inside unit (the evaporator) is about 24 by 22 by 5 inches

and is recessed so no exterior condensing unit is needed by a pair of coolant lines. Split systems are thermoelectric—radiated and come in a range of sizes, though even the largest won't cool a whole house. It may take two, three or more, depending on the climate and the size of your house.



From treatment by the Institute of the American Society of Heating, Refrigeration and Air-Conditioning Engineers discussing residential heat loss in the Northeast. (Editor's Note: "November/December," Heating, July, revised and updated version of the Institute's *Handbook of Residential Heat Loss* in the 1997 ASHRAE *Handbook of Fundamentals*.)

On Page 20 of the November/December issue, you talk about re-wire-mats magnets ("Map the Force to 99% You"). Rewire-mats permanent magnets are typically manufactured of anisotropic cobalt or neodymium iron boron. For use on motors, The picture shows them attached to a rail way, but they are not to be played with as you might with low-strength-alloy or iron magnets. Rewire-mats magnets are many times stronger and dangerous if you are not careful. They can cause injury by pinching the skin and are difficult to remove.

Bob Coughlin  
Building Consultant  
P.O. Box 400  
Annapolis, MD

Your point goes to the heart of the soil ventilation debate. In which we put one house good for old houses, good for old soil. The first question about soil venting was developed at the 1976, when houses typically had high rates of air infiltration and soil ventilation. In those houses, cold outside air would be welcomed when it entered the attic, picking up moisture before passing through an exhaust vent. According to the

rule if they get two above together, these magnets are also very brittle and also break when dropped or allowed to drop together. They shouldn't be used as toy.

Frank A. Heidt III  
Program Manager, Aerospace and Defense Products  
Kolmangan Technologies  
1000 16th Street, Suite 1000  
Washington, DC 20006

While watching the rebuilding of the Concord Inn at The Old House Complex, I saw a segment on a radio station interviewing them. Wisconsin. I was interested in knowing more about this company and the cost of custom windows.

Mike Witten  
Milwaukee, WI

Answers, a family business established 25 years ago, built the classic cabin over 100 years out of red oak in the eastern seaboard of the Concord Inn. Answers says that standard windows never or around \$4,100 and go up from there. You can contact them at Answer Inn, 1777 Bedford Road, P.O. Box 543, Newmarket, NH 03763, 603-546-3094. (For more information on The Old House Complex, see page 512.)

## punch list

definition: a list of items inherently slow or annoying to be finished in a construction job

A few months ago, we learned in the January/February *Director's News* that we won the Photo of the Month contest. The article in *Director's News* (January/February 1998, page 41) had a photo of a "punch list" (left). The photo, by photographer Phillip Tipton, was incorrectly captioned. "The photograph, 'Punch List,' was incorrectly captioned. The photograph by Phillip Tipton,

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## Plumb Crazy

Hopelessly lost in the remodeling zone

BY JEANNE MARIE LASKAS



One thing about home remodeling projects is they make you focus on things you've never thought much about before. I'll give you an example: wallpapering. About five years ago, I started my first wallpapering project. The room was the kind you shouldn't even think about papering—a closet-turned-bathroom with weird angles, a crooked shower, not a straight line in sight

Many plumb-line challenges ensued, not to mention huge blocks of glass shattering, come-up roses. But the real fun would come afterward. I'd be at a friend's house. The friend would be talking. The friend would be importing big, distance news. But I would be otherwise engaged. I'll give you an example:

Friend: I'm leaving an after with my loss.

Mr. Un-fish:

Friend: We're thinking about moving away to Tahiti.

Mr. Thirsty:

Friend: Bet believe that we're going to take a lot of books and about fifteen thousand books.

Me: I see. So, when you hang this wallpaper, did you begin with the paper near or close to the floor there?

Friend: Because not?

Me: And those ceiling edges. Did you use a knife or did you

seize the paper first and then cut it with scissors?

Friend: What?

Me: You know, my momma's a lot kookier than yours. What's your secret?

Friend: To say, stopped unpeeling big, dramatic curves to me because my father was elsewhere. That's it in my wallpaper stage.

When a person is so far out there wallpaper stage, the whole world is suddenly divided in two. That sort of things having to do with wallpaper, and then there is everything else. I no longer regarded level tools as level ones but to people who wallpapered. Writing my mother one day, telling her come on ahead to trip to France—or maybe it was something about writing in give peace a chance—I learned that she was the type to write her paper as opposed to hanging the edges. You don't find many cross-hoppers on endpapers.

Writing my brothers, telling us to hang all straight about



making waffles—or maple or white-bean oatmeal—I learned that he is the type to fungi plants here altogether. His whole kitchen seemed to be leaning, thanks to the wall paneling tilting over so slightly to the right. Why had I never noticed this before?

Because people aren't supposed to notice such things. Because wallpaper is supposed to be background. But it no longer was to me. The background of my life had become the foreground. And vice versa.

It could happen to anyone. When you take on a home remodeling project, your whole world is suddenly seen through that prism. The phenomenon goes well beyond a matter of obsessing about something—oh, say, why do you think you're hungry and all you can think of is sinking your teeth into a burger? It's more of an organic thing, a total brain shift. Your brain is now seeing the world it once was.

I'll give you an example: roofing. When I was putting a new roof on my house, it got to the point

away from a remodeling project when you're in the midst of one.

"It can be very hard on relationships," she said. "At least one ex-boyfriend of mine would agree. But in this particular case I plead innocent. Because it is a fact of life. All we panel doors are not the same. I hasn't noticed this until it's come time for me to replace my bathroom doors. I picked the good ones, the solid panel ones. And then I couldn't help myself. I went around knocking on people's interior doors to see if they had the solid lead or the hollow lead. But I mean no harm—just hunger! And what kind of taste-tester am I?"

"Well, one day I knocked on the interior doors of the boyfriend's condo to discover an unsettling truth. His doors weren't solid wood. They weren't hollow wood either. They were...plastic."

"Composted?" he insisted, grasping for forgiveness.

"It's interesting to note how my life could be entirely different had I not noticed my ex-boyfriend's door might. I might have gone

**Wallpaper is supposed to be background. But it no longer was to me. The background of my life had become the foreground. And vice versa.**

on obviously opening and shoving the plastic doors of that man's condo all the way to the floor had the foreground of my life not become background, and vice versa.

It is a necessary shift in paradigm. Home remodeling when done are what enable you to do good work. To lose yourself in a project to such an extent that one door of the back-bone of your life becomes the entire foreground is the true mark of craftsmanship.

Or so I tell myself. What, after all, becomes of the person prone to remodeling obsessiveness? Do you turn into a complete recluse who can never again focus on a conversation and who continually lectures friends on interior building mistakes? I don't think so. Home remodeling fanatics like, though minor twinges do remain. I can't remember the last time I knocked on someone's interior doors, although I have to admit it's difficult for me to resist stopping on the occasional oak table and grasping at how many coats of varnish might have been applied.

And my wallpaper obsession? Well, nowadays when I walk into a bathroom I don't even notice the wallpaper. I'm far too busy studying the wall-hung head, wondering if the person who applied it held the gun at a 45-degree angle, a 20, or perhaps a 73.

"The truth is," I told her, "if you're going to replace one wall, you may as well go ahead and replace both. Do you have anti-weight packets on those windows?"

She gave me a blank stare.

I apologetically, explaining how hard it can be to pack your boxes

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That bag contains 100% of the balanced nutrition your dog needs for a healthy, active life — no other dog food can beat it. And with rice, which is easy to digest, your dog will get the most out of what's in it. Naturally, the many taste ALPO has long been famous for is in there, too.

A GREAT DOG  
DESERVES **ALPO**

©1987 Purina PetCare Company

# extras

Photographs by Dennis Madlener

## grime control



PHOTOGRAPH BY DENNIS MADLENER

A satisfying moment: When work is done, you wash your hands of the day's grime and grease. Getting rid of the stress may take some time, but with today's hand cleaners, the dirt goes fast. **Waterless creams** (6), get soap (2) and pre-moistened paper towels (3) are popular due to some of the 19th-century concoctions we've learned about—strong bleaches, blends of super-tough oil and organic acid—but they still contain solvents and detergents (which, in extreme cases, can cause minor irritation) and leave a waxy residue. To play it safe, dermatologist Bern Lichtenberg of the National Institute for Occupational Safety and Health recommends using mild cleansers—used no more often than is absolutely necessary. Products with abrasives such as purée (8) and sand and powdered nutshells (9) are okay for clinging grime, when skin is healthy. On lesser stains, abrasives may cause a tingling irritation, but "that isn't 'deep' cleaning," Lichtenberg says. "It just means skin has been removed." Skin can take a toll before the work's over, with barrier creams (10) applied several times a day. And when it's time to wash up, when I let my clothes soak in laundry, scrub hands quickly with a soft sponge brush, rinse right away with water and apply moisturizer. Here the choice is easy: Testers have shown that common, inexpensive brands are just as effective as fancy formulas that cost a lot more.



(See Cleaning, page 116, for details and amounts)

## the treasure in the old post

Jeff Wuerthoff was rummaging the shelves in his 100-year-old Atlanta Mercantile when he poked into the hollow reveal panel, a place where hollows often lie: treasures. He was rewarded, inside was a note that read: "Made by G.M. (Flocke), Feb. 8, 1888" (indicated). Wuerthoff doesn't know if any of Flocke's descendants were still in the area. Though it's likely the learned of restaurateur Joe Flocke, who gives his name to his craft using a set of old tools. Turned out that Flocke, a GM, is the grandson of George Morris Flocke, and these tools are the very same ones GM used in Flocke's restaurant. When Wuerthoff invited Flocke over to check out his treasure's handwriting, he learned how GM got his start. He had lived through the battle of Atlanta during the Civil War, and soon after, at 16, began clearing his trade in the rebuilding of the city.



## Home on a Range

As any home owner knows, the more people who visit, the bigger the chances of getting an oiler and handbag scuff in the kitchen. To combat this, a popular hand cleaner—marking (HWM)—experts recommend more often used by a few companies, instead of attacking at nightime. To their pleasure, visitors and their visitors to a range from 1 to 100 and price to the highest. Some may need help for a bit of the kitchen, a visitor who wants \$125,000 might not be the best for \$125,000. And with WHM, he would put it in the \$100,000 to \$125,000 range in terms of drawing buyers who normally wouldn't look at houses there, says Bill Miller. The problem, says Braden, is that the New Jersey, broker who doesn't use WHM, in that case visitors have no intention of accepting a low and offer. "We're seeing buyers interested in property they don't intend to use a range that isn't a true indicator of the seller's position. WHM holds every negative perception of the seller—poor hall and lead," he continues, "which leads to bad by the Residential Real Estate Affiliates showed that their WHM-based homes sold 10 percent faster than single-family cottage and had about 10 percent more buyers than the midpoint of the range."

"I don't know many carpenters who don't carry a jackknife."

Norm Abram



## Can't Beat the View

Got a burning desire to get away from it all? A fire tower may be just the place to quench it. A new book, *How to Rent a Fire Lookout in the Pacific Northwest*, gives details on dozens of former ranger cabins, warming stoves, bookshelves and lockouts in national forests of Oregon and Washington. We're dreaming of a new night in the Indian Ridge Lookout in Willamette National Forest, perched at 5,000 feet. Just \$25 a day buys a 10-by-10-foot perch atop a 38-foot tower; you'll have to come well prepared, though—the place lacks plumbing, heating and electricity.



## NOT CAUSING A STINK

Choosing the continual stink dog owners' pride in their pet's piling up of a soiling stink is something many dislike. That was the problem for one Pennsylvania homeowner, who stopped outside to find a misleadingly clean dog pile on the lawn—stinkified, it turned out, in a bathroom not left on the ground. A call to the lawn's landscaped department netted this: "We don't do stinks," said the voice on the other end. A company advertising business around the corner? In the

first Central section of the *Yellow Pages* (decorators, who'd buffered a tip). Use italics to warn them off: writing into a contact option or other potential buffer, "I'm interested but I'd prefer not to add to the pile for \$25." Happens all the time, especially with soccer gear? The next: "I apologize accordingly to the internet. He was able to rip off one of the heads from around to heel and set it free—or without a wiff of lambskin scent."

## Events and Appearances

**Warren Alanen** April 14: [www.brownandallen.com](http://www.brownandallen.com)  
Lawn Park, IL 800-750-2321

**Steve Thomas** March 14-17: Texas Utility Expo, White  
Trucks of Alberta, Royal, Alberta, AB 800-630-7502  
April 4-6: [www.kippin.com](http://www.kippin.com) and Bob's Show, McGehee, AR 800-327-2957

**Tony Shatz** March 1-2: [www.brownandallen.com](http://www.brownandallen.com)  
State Extended Care Center, Waukesha, WI 800-684-4796  
April 4-6: [www.brownandallen.com](http://www.brownandallen.com)  
Mart, Okemos, MI 800-444-0544 ext. 100  
April 15: [www.brownandallen.com](http://www.brownandallen.com) and Bob's Show, McGehee, AR 800-327-2957

**Richard Brookaway** March 7: [www.brownandallen.com](http://www.brownandallen.com) and  
Gardens Show, Americas Center, St. Louis, MO 314-661-7792  
April 4-6: [www.brownandallen.com](http://www.brownandallen.com) (see above)

when you need to measure  
a space without a tape

**arm span = height**

(give or take a couple  
of inches)

See Advertising page 118, for details and sources

## eastern blocks

With this maple block set, your little Ivan (or Ivan the Terrible) can create mini Kremlin domes and ditches. The award-winning 57-piece collection contains 17 shapes, including the familiar onion domes that adorn Red Square.



See Construction page 38

## a

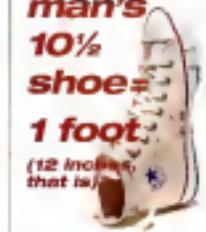
**man's  
10%  
shoe?**

**1 foot**  
(12 inches,  
that is)



## make a splash

If water—or spilled coffee—has ever wiped out a page of shop notes or sketches, you'll appreciate this in the Rain notebook paper. Its patterned coating sheds water but doesn't resist scribbling in pencil or ball-point pen.



## 50,000 skyscrapers

What I have learned that the Empire State Building could happen, you know as a kid, would someday be in a massive sheet? Margaret Mead and David Wartanian have collected the hundreds of building structures that are on display this year. May 4 at the Oregon, the Museum of the American Architectural Foundation in Washington, D.C. Among the soaring skyscrapers, coffee cans and mannequins are many that do double duty: St. Louis' Library Tower, Big Ben (Elizabeth Tower, Independence Hall), and Lincoln's Lincoln's Tomb and Pepper Shakers. The museum, featuring 500 structures, is open weekly while it's open, so it's leading the next eight days out pre-lease to benefit the foundation.



## site visits

When Jon Zimmers started his Web site in 1994, it was the first of what are now several sites devoted to finding, buying and selling vintage tools. "People warned me that old tools don't sell anymore," Zimmers says. "But now I've got a third of my business on the internet." As well as doing a lively trade in Western blacksmiths, Zimmers' Antiques Tools ([www.antiquetools.com](http://www.antiquetools.com)) also offers a wide range of old hardware, old antique, collectible and decorative tools.



Tools ([www.tools.com](http://www.tools.com)), there are more word sites and a fascinating heritage to the equipment: turning lathes, an ornate combination-worked by collectors and collectors. For collectors and collectors like the Museum of Woodworking Tools ([www.woodworkingtools.com](http://www.woodworkingtools.com)) has several Web exhibitions, including "English Shoulder Planes 1800-1900" and "Gentle Joining" (see A).



## save those empties

When retired lumberjack David G. Brown built a house to house a material that was close at hand—and free: empty embalming fluid bottles. Although he was "not a real collector," he claims, he was a "proud one." The bottles, squares of glass blocks surrounded by a decorative border, were 100 percent made from 100 percent glass. Here's his original formula: for every 100 square inches of wall, add on one bottle length block. He intended to repeat this for 40 inches of floor space. Writers are curious to know, British Columbia, but one lineage means the entire 1,200 square foot house. Even before a wife, Barbara, in 1962, the craftsman structure drew a disconcerting number of curious visitors. Charging admission didn't discourage them—but it did add to his profitable sideline, which Brown's heirs who no longer live in the house, continue to operate.

## volcanic counters

From a quarry in southern France, comes a unique addition to the list of counter materials: lava. The dull brownish stone, mined from an ancient volcano, is glossed over with impermeable glazes to create a surface that looks like one piece of brilliant red rock. Gaudi fabricated in stones up to 12 by 4 feet and 12 inches thick, pieces can be joined and nested with a water-cooled grout. The rock, weighs slightly less than granite and marble, but the cost is 10 times more, about \$200 per square foot.





We started with an open mind. And proved how surprisingly responsive, strong, capable and comfortable a truck can be.

The many cubbiesholes, cupholders and storage bins offered in the new Dakota make it a great place to put your stuff. While things like standard dual airbags and high strength steel door beams make it a great place to put yourself.

You can opt for a premium Infiniti® stereo system with cassette and CD player in the new Dodge Dakota. Right speakers in an accurate kick out your real concert-quality sound.



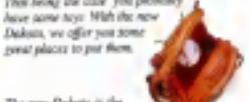
Be closer to your individual needs by offering a driver seat that does that. Now, for instance, the adjust white lumbar support. What's more, the all-new Dakota Club Cab's driver seat can be reclined 20°. And the seat itself is designed to help protect you in the event of a rear collision.



Four-wheel anti-lock brakes are standard on the new Dakota. And for even control when breaking and steering, you can opt for four-wheel anti-lock brakes.

With up to 39% more seat travel, comfort is within easy reach, whether your legs are on the phone side... for long trips... or somewhere in between. Great news, since even a little shifter can really be unsupervised over a long drive.

We're willing to bet, you're a fun person. That being the case, you probably have some toys. With the new Dakota, we offer you some great places to put them.



The new Dakota is the roomiest truck in its class. There's even a forward-facing rear seat in Dakota Club Cab, with enough leg room to rest there without your passengers will be beside themselves with comfort.



# Thingies, doo dads, whatchamacallits & other nifty no tables.



CDs, cell phones and other everyday accessories can be conveniently stored away in the all-new Dakota's spacious new center console.

A pickup that offers the luxuries of a car—the conveniences of a people mover—and the uncaring predictability you might expect of a sport utility?



Most times, you won't be hauling much more than a steaming cup of coffee in the morning—or that over-sized sack that makes the afternoon commute bearable. It's for precisely these occasions that we offer up to five cupholders in the new Dodge Dakota.

The new Dakota Club Cab's forward-facing rear bench is only part of the story. For another pleasant surprise, check out the convenient storage bin under the seat.



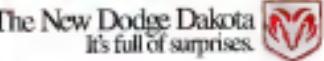
For more surprising facts, call 1-800-4-A-DODGE, or visit our Web site at <http://www.Dodge.com>.

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The New Dodge Dakota. It's full of surprises.



Club Cab Sport Red

Always wear your seat belt. It's the single most important safety device you can buy. (Don't drink and drive.)



## three-piece starts

General contractor George Souza doesn't mind. He's the brains behind Home2fix, the Old House's plumbing expert, who fixed the damage—and \$80,000 worth of damage—from a burst washing machine hose. He says, "It's not that it should be checked regularly for leaks, cracking and stiffness; it's simply replaced with today's better



## The Big Spill

Putting the laundry room upstairs is efficient but risky. "It destroyed my parents' house," says Richard Timmey, the Old House's plumbing expert, about the damage—and \$80,000 worth of damage—from a burst washing machine hose. He says, "It's not that it should be checked regularly for leaks, cracking and stiffness; it's simply replaced with today's better

version, which is fitted with a braided stainless steel tape. If it does give out, it will only leak, not burst. For about \$25, that's pretty good protection. Then, better, but at a slightly higher cost, is the hoses and the water supply. The increased type of tight stainless steel lines will not allow the metal-to-valve fit to open only when the washer is running.



## blow out

What's the best way to cover the air when using caulk? Tap! To fit out, the International Brotherhood of Painters and Allied Trades implemented with a window trim kit that was being planned. Painters haven't stopped complaining when the trim blows from the drywall into the moist and fissile air gap outside (With the ten-second round to pull it out, levels were raised to 10). Another tip: Always apply in the direction of the air, where heat or air is more plentiful.

PHOTO COURTESY OF HOME2FIX.COM; TOP: COURTESY OF PLUMBING SUPPLY

## LOW-E ON A ROLL

It's not the high-tech time that has the efficiency of your windows can be applied to existing single-pane, VPI—the insulation of the "low-e" feature of high-performance glazing. Some of these sun blenders are available in their form as an independent film, one-fifth the cost (about 30 percent). It also reduces heat gains by 70 percent. In summer, it's possible to switch on "heat-reflecting" windows in winter (either of all window form). Low-e versions are applied with a roller or squeegee and adhere like water and dish soap. We can say it's thermal energy that effort will save—actually each \$100 left in a hot cold room—but if it's built a square foot, it's sure beneath the price of a new window.



## Grow in Peace

If you're planning to build an addition to your house, don't forget to increase your landscape coverage as well—before you start. Most homeowners don't do this, but it's a mistake, and it's not only to keep your soil healthy that, it might not be covered. Your raised beds will be a lot of help against features and rough elements of the square foot in the added. The soil will also ensure that plants continue to grow in a permanent, balanced manner, as noted in Bergbaum, New York, says that "it's hard to see the impact pressure will increase by two times. Now it's going up, implying only get the most from your bed.



## Save This Old Tool

Thanks to Woodstock at Poughkeepsie, West Virginia, went to selling power tools on profitably since 1980. The Poughkeepsie tool has been in the service last year and has been taking in full a dozen tools a week from homeowners and landscapers. "The estimate is 100," he says. "We pay for parts plus labor of 47 cents a minute with 10-minute minimum. Tools brought in are given a discount to the Great Recyclers of Poughkeepsie. We sell them for spare parts. Grill, lawn and garden assistance for most of the tools, and the other present order has been a Stanley model about 30 or 40 years old. I found new bearings for it," West says, "but I'm still hunting for bearings."



"A house consumes the lion's share of our wallet and the sweetest side of our material dreams."

Don DeLoach, architect

## shear strength

When it's tough to cut through metal, there's no easy way to get extra power to your hands. Turn the saw steps around and cut



power you. You'll get more leverage because you've increased the distance between the snap's pivot point and the point where pressure is applied on the handle.

## alternative rock

When all else fails, break the standard house pattern, and what if you want to take a more traditional approach, the standard is not the best. You should be aware that there are many ways to make a house look like it's not just a house, but also that there are other houses that could never provide it. These houses are built with simple materials, such as stone, again, stone, concrete or other stone, but not in the same way. All about 20 minutes per cubic foot, the standard house is about 1000 cubic feet, the weight of a concrete block of granite.



brownstone is back

As in 1880s America, brownstone was the preferred building material. (The urban upper-middle-class, spreading throughout the Northeast, built 10,000 brownstones across New York City alone, it became the 19th-century equivalent of aluminum siding in trees and more.)

But it's not an ancient material—new brownstone blocks, but the old ones don't always weather well, and today's as in the old brown stone is on the rocks that a brownstone quarry, started since 1980, has reopened to help save them. When he restored the quarry, Mike Moshier, owner of brownstone quarries, spent a year "restoring the brown stone," he says. "We got over 30 purchase orders. The business is going to work." It's good news for masons because until now the standard was involved chipping away the damaged areas, removing the rock with concrete (or cement) and replacing it with the mixture. But that method was only good for small patches. For bigger jobs, masons use steel mesh, which can carry over 100 lbs. and is one of a very few that can

Georgians. Colonials. Victorian. They're architectural jewels of tradition long since past. Jewels that embody your passion for grace, elegance and style.

Restoring them is your labor of love. But as beautiful as these classic homes may be, their subtle stone, latticework, un-insulated walls and typical roofs & eaves mean high energy costs and annoying discomfort. Until now, the only solution was stripping plaster to the studs.

Introducing The Icynene® Insulation System.

With Icynene, we can help you preserve those architectural elements you truly love, while substantially improving your home's comfort and energy efficiency. And because Icynene expands to fill every nook & cranny and adheres to everything it touches, you can eliminate costly secondary building materials, like vapor barrier and caulk.

The result is a home air sealed from the outside world. No drafts. No icy cold floors. It's also comforting for those who live

in sweltering southern climates.

For allergy and asthma sufferers, Icynene is a breath of fresh air. It prevents the development of mold in wall cavities and prevents dust, pollen and other pollutants from entering your home. In fact, it's used in Long Association Health Houses®.

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## Ladder Sense

The higher you climb, the harder you fall

BY JAMES MORGAN PHOTOGRAPH BY MICHAEL MYERS



versince  
our anenomea climbed down  
out of the trees, man has  
been a terrestrial animal  
and has assumed a little relation to clouds  
back up that great peak, passes along, with  
down under and roofs low shingles, so we  
have ladders, like portable roofs, to led us  
20, 30 or 40 feet above the ground. So we  
can't seem to get through our thick pressure  
skins that ladders, make trees, are not  
firmly rooted to the ground. (Perhaps it's  
the climate that more otherwise compassionate  
people enter heaven.) Nearly 140,000  
people were in emergency rooms for  
ladder related injuries in 1995 alone, an  
average of 383 visits per day.

Professionals who spend their lives  
climbing trees that when it comes to ladders,  
only one thing matters. They must  
remain stationary. All ladder makers  
know this rule.

The first bit of advice is: Don't be  
cheap. "Buy the best you can," says Thor

Werner Terry, 55, who has been a  
ladder safety builder for 18 years. He  
uses the ropes, well away from the climbing  
range that could strangle the fingers



# Reach for the sky

PHOTOGRAPH BY DARRIN HAGGARD

GM Home contractor Tom Silvia: "Ladders are valuable to cut costs." Tom uses only commercial- or industrial-grade aluminum ladders. "Frankly, I don't think there should be anything else out there," he says.

But there is. Ladders come in three extensions—wood, aluminum and fiber-glass—and four grades: light household duty, commercial, for pros and general handymen; industrial, for construction and maintenance workers; and professional grade, for rugged industrial and construction use. The most important difference between the grades is the weight they will carry—from a 200-pound maximum for household duty to 300 pounds for professionals; grade. Few ladders this far down even make it in careers, when he still felt invincible. "I went to a job and didn't have my ladder with me, so I borrowed the homeowner's cheap aluminum one. The theory being buckled and I fell."

Having chosen a good ladder, there is the crucial business of its use. According to John Dee, a passing contractor in Concord, Massachusetts, a ladder's feet should be placed away from the wall one-quarter of the ladder's extended length. In other words, a 16-foot ladder should be four feet from the surface it's leaning against. "And it's always safer to pull the

## Telascopes

judged on the ratio of storage width, aluminum and fiber-glass—and four grades: light household duty, commercial, for pros and general handymen; industrial, for construction and maintenance workers; and professional grade, for rugged industrial and construction use. The most important difference between the grades is the weight they will carry—from a 200-pound maximum for household duty to 300 pounds for professionals; grade. Few ladders this far down even make it in careers, when he still felt invincible. "I went to a job and didn't have my ladder with me, so I borrowed the homeowner's cheap aluminum one. The theory being buckled and I fell."

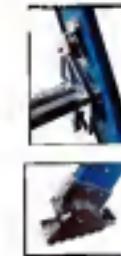


## Stacks

Guillermo Lightfoot created tapered wooden ladders to hook onto the tops of ladders. Whether workers found this tip so useful or not, traditional and made stackable varieties have stuck. Built by ladders that reach up to 30 feet, tapered ladders are either pre-grooved or made using tools designed to create a tapered slot and made for use in offices or laboratories. Measuring multiple pieces can be utilized or measured. Most have long beam ends of about 30 inches, but that weight increases as the ladder has tapered arms manufactured to size fiberglass.



## Extends



An extension ladder should always be set against a wall with the rungs held in the vertical position. A rope and pulley holds it up and keeps both feet in place. This industrial-grade ladder from Fiberglass rolls and stands when set with poles that jam into soft ground. Fiberglass is strong and safer around wires than aluminum, but it's heavier. Double-decking it, exposing them and letting it stand when the surface is damaged, split-comes with polyurethane paint.

## Folds and slides



This articulated aluminum ladder, which extends to three times its 47" storage size, has rails that run one inside the other and spring-loaded pegs, top, that snap into the rungs. Self-locking hinges, wheels, turn the ladder into an adjustable-height device. Snapouts are used. Fiberglass has a side of the A and the ladder sits over an attachment or support ground. Fiberglass adds extra additional side-to-side stability. Aluminum is light, strong and durable but also a conductor. It should never be used near overhead lines.



## The well-dressed ladder



Padded standards prevent sharp-edged ladder rungs from putting holes in drywall.



Steel roof hooks safely hold a ladder to the roof peak. This pair averages in for strength.



Rubber heelers are another way to protect walls from ladder-end corners.



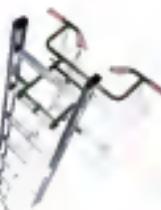
A safety-welded aluminum step makes step edges 40% more resounding on the floor.



Two-level feet keep an extension ladder from "pitching over" backward as it's being raised.



Self-leveling feet compensate for uneven terrain, so the rungs remain horizontal.



This shock-absorbent neck on the roof, springing putters from metal-to-metal collisions.



A stabilizer bar works around windows and provides a perfect spot to hang paint cans.

ladder not further than to pitch it at," Der says.

Up to a point, Tami adds. "If the ladder's not steep enough, you can't have good bearing." Tami uses the L-shaped ratchet track on each of the ladder's rungs as his guide. If the L's short leg is horizontal and its long leg is plumb, the ladder is at the correct angle.

Once a ladder is at the proper angle, it needs solid footing to stay that way. On soft ground, nail pegging shoes to the dig in or drive wooden stakes behind the rungs to prevent slippage. When the ground is too hard or too slippery, or there's nowhere to drive stakes, tying off a ladder rung to an immovable post or two is a cheap insurance. "Never stand a ladder on a drop cloth," Der says.

Even after a ladder is plowed, waked and nail, Der doesn't climb until he applies his continual rule: "Sense the issue of ladder stability on the first rung." In other words, if a ladder doesn't rock to one side or pull away when he leans back far to his left, he'll be safe near the top. Der lists top problems while he's securely on street firmly. "If you take your feet up

the ladder, it will affect your work," he says.

It's tempting to dress up a ladder with accessories, if you don't need the added weight. Some add-on features protect walls and gutters from scariest, others, such as self-leveling feet, improve safety. But consumers waste in the most important ladder: Der has seen people perchched on the top rung of an extension ladder (you shouldn't go higher than the fourth rung) or standing on one face, doing an arabesque off to the side. "Kinch with your arms, not your body" is Der's advice. He's seen people carrying fully extended ladders and walking back wards—blind to ledges, windows and power lines. "Always collapse an extension ladder before moving it," Tom says.

Perhaps the most bizarre example of common sense taking a vacation is Der's tale about the guy who put his ladder on the roof to remove a chimney. "He didn't have a roof hatch, so he tied a rope to the ladder, swinging it over the peak of the house and secured it to the bumper of the client's car." You can imagine the rest.

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SUIT FLOOR SAVINGS



HEAVY DUTY  
SUIT FLOOR SAVINGS



DUAL POSITION  
POWER SAW

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DISCOUNTED RETAIL PRICE  
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MSRP  
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ITEM #10101



**INDUSTRIAL  
ROUTER TABLE**  
DISCOUNTED RETAIL PRICE  
**\$999**

MSRP  
\$1019  
ITEM #10102



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Powerful Tools. Smart Home Tools.

PHOTO COURTESY OF CRAFTSMAN TOOLS. EDITED BY CRAFTSMAN



**t**

he whir of a circular saw and the steady rumble of a concrete truck have long been signature sounds of house construction. Now there's another: the whup-crack of steel being shot into concrete. The device at work is a "powder-actuated fastener tool"—what most

werkmen call a stud gun. Tom Silva (above), contractor for *This Old House*, calls it invaluable. There's no faster way to join wood to concrete or steel, he says. Tom uses his stud gun to nail framed walls or flooring sleepers to concrete floors, to secure wood nailing to steel support beams and to fasten furring strips to masonry block walls. For finishing off a basement, he says, "Nothing beats 'em."

A stud gun works like a miniature pile driver. Exploding gunpowder propels a pin against a hardened nail called a pin. The pin travels so fast—up to 325 feet per second—it can shoulder aside wood or concrete. Both materials are dense enough to snap back across the former the instant it stops. A pin needs to penetrate only an inch or so into concrete for metal to go through, easily, but that's more than enough to keep wood in place on a slab. "To pull a pin out,"



A pin shot perfectly into steel penetrates (but won't) the tape. The steel grip is the pin shaft in a transverse, nearly unbreakable hold.

that says, "you'll need a thousand crowbar"—it's front of up to 1,800 foot-pounds. There are other fasteners that hold better, but once the walls are in place, you won't be subject to withdrawal anyway. Don't even try to pull one from steel—your car's

The gunpowder charge, known as the load, determines how deep a pin will go. Loads, like the gun dimensions, come in calibers of 22, 23, and 27. All loads are numbered from 1 (shortest) through 12—longer are also called extendable loads and pins are not always

## Stud Guns

Ask questions first, shoot later

BY MARK FRIMER

unstoppable between nations. Pins also come in a variety of diameters, lengths and styles, depending on the job it needs to do. Most are made of heat-treated, high-carbon steel, which will not let a pin drop. Tension corrosion could be a problem, but stainless steel pins.

Even with all that firepower behind it, that's not something a pin will penetrate. Concrete varies in density—old concrete is harder than new, for example—and it's laden with stone aggregate that sometimes stops pins. Steel is also unpredictable. Thin steel wires of the 4-thread hex firing pin can be stopped by one sharp hole (such as Buck buckshot) or hard. He usually uses shoots a couple of pins, starting with the lighter load to make sure it will work, before he settles on a charge that doesn't load the pin or send it too deep. An overdrive hammer beats a head in the wood, driving wedges and extracting holding power. "Not a pretty sight," Tom says.

Some materials can resist pins: glass block, fireproof brick are too brittle or without the force, whereas stone, steel welds are too dense to penetrate, wood is too soft to hold a pin. To respect surfaces, do a pencil test first by hitting a pin with a couple of moderate hammer blows. If the pin's up bloom, the material is probably too hard. If the material cracks or chips, it's too brittle.

Once the washer pin and charge is in the substrate, he can shoot as quickly as he can load. He pin-slips a pin into the barrel, holds the gun perpendicular to the substrate, presses down hard with both hands (to cock the trigger and fire) and drilling, no wait.

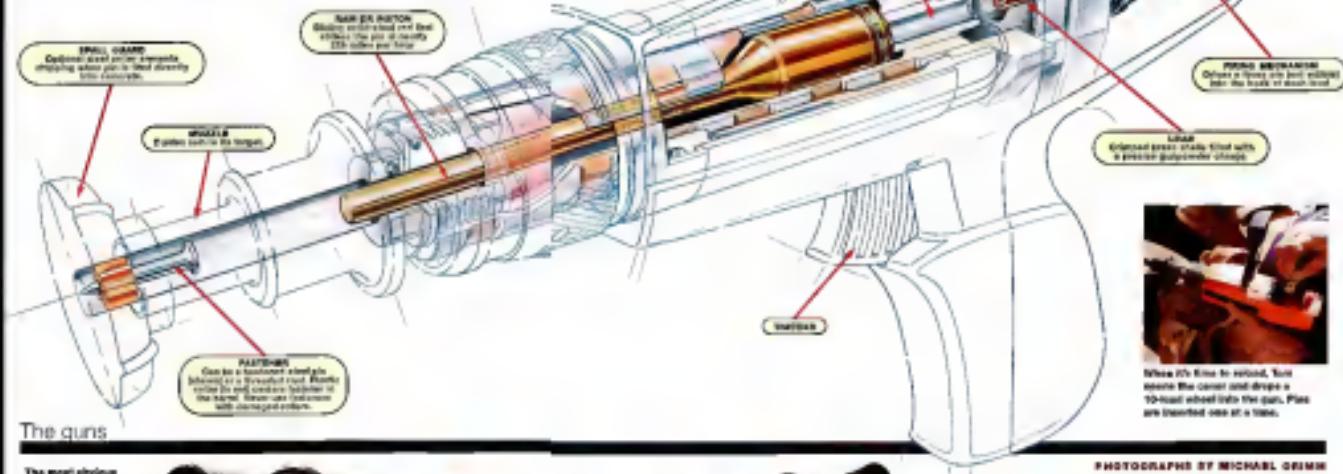
Tom first used a powder version, used 20 years ago, when he did some starting cases. "We'd put one pin and one shot into a chug that looked like a bicycle hand grip with a mitten on.

(Continued on page 450)

## Ready to fire

ILLUSTRATION BY TOM HESSER

Pulling the trigger snicks the spring-loaded firing pin into the back of the gunpowder-stuffed load. The force explosion that follows blasts the ram against the head of a hardened steel pin with enough force to instantly drive it home. Stud guns aren't weapons; they're engineered to fire only when pressed firmly against a hard surface.



### The guns

The most obvious difference between stud guns is the way pins and loads are inserted. The basic models, right and middle, are single-pin, single-load. You insert one pin and one load at a time (and that's it), so it's probably the easiest to understand. The next step up is to a single-pin, multi-load tool like the one that Tom uses (Illustration right). The loads are inserted one at a time, using a hex key, but it still inserts pins one by one. Other brands suggest 10-load plastic strips. The ultimate stud gun, far right, would please Eliot Ness: It's a multi-pin, multi-load model with a magazine that feeds calibrated pins in a disk or strip feed mode. It can shoot pins like the chicken.



PHOTOGRAPHS BY MICHAEL GRIMM

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### The ammunition

Short-gauge microseisms, a steadily increasing phenomenon, and seismic, (c) Long (Great) waves are the seismic waves due to diffusing disturbances, such as longships, small boats, and so on. A small (short) wave may consist of a series of long waves of long period, when occurring simultaneously to land surfaces. (d) Capillary waves consist of ripples occurring between waves. (e) Shakes of hands, waves speed the Pogene waves, 1000 ft. of latitude, 1000 ft. of longitude, and 1000 ft. of depth, 1000 ft. of distance, 1000 ft. of time.



rop, and I'd just whacked it loose with a small wedge." Later, students applied the wedge with a trigger-activated long coathanger and the coathanger had been broken.



upper-activated Greg coaches.



Once he has cleaned and assembled his gun, Tim fires it to test that mechanism. With no gun or charge aside, he cracks the gun by driving it against a piece of raw wood and pulls the trigger. If not, he relies on superstition.



This pin has its weight—a  
silver base base to provide  
balance and split the  
weight evenly in base. On this  
model used, there would be a  
 heavier pin or a lighter  
 weight, which subjects a  
 balance in less stress.



The partially short庚子年  
only be possible estimate an  
to be a sure grip.



most parts replaced with a minimum of effort. For carpet cleaning, use a stiff brush and a rag saturated in a solvent based cleaning fluid. Even then, the black-grey powder residue that collects on internal parts after two or three thousand laps, the run-up on the mainshaper, so to speak, off the bows and flattens the tip, can, repeated filing will sharpen the nose, and it will need to be replaced.

## Borrowed Light

Glass block recaptures its old mystique

BY ANN ARMSTRONG PHOTOS BY NICHOLAS EVELDSON



This shimmering 1935 addition to one of the Chicago area's best-preserved Art Deco houses is as tough as it is translucent. The two-story, steel-reinforced tower contains 324 glass blocks polished to match the house's Deco-style original.

**Whenever the sun** shines, Roslyn and Arthur Don witness a mesmerizing light display at their 1935 Art Deco home in Wilmette, Illinois. From dawn to dusk, a curved two-story tower at one end of the living room is awash with subtly shifting

rainbows from reflected sunlight. At night, clear bursts of soft white light play across the wall as heatwaves from passing cars break and scatter on the tower's cold steel surface. From outside, the structure glows "like a sputnik," Roslyn says.

What makes this daily masterpiece possible is glass block. Although they function like bricks—stacked and mortared, resistant to fire and windable—these hollow blocks of fused silica gather, bend and reflect light, turning solid, with outlandish curves. Glass block can bathe interiors in a surreal glow just past the elements and glaring eyes. Glass block and its antecedents have been borrowing light

for more than 100 years. Nineteenth-century boat-builders embedded thick glass lenses in ship's clerks to entry illumination below.

Solid cylinders of glass stored up sidewalls, brightening soldiers' storage mess. Glass

When glass block found its place in Art Deco, architects spoke up to save it. Now its use is on the rise, in homes as well as more than 50 percent of new



PHOTO COURTESY OF THE GLASS BLOCK COMPANY

Most people think of the sport-utility as a nerve-free living creature. But soon they discover the true nature of the beast. Its jerking and snarling ride. Its unpredictable thirst for gas.

The Subaru Outback, however, is a

chameleop

Then I became every

Outback features the

Subaru All-Wheel

Driving System, a

unique design that conquers the

biggest side-impact crash, example  
s and four  
channel ABS.  
For all other  
pedestrian protection

through the walls of the cockpit jungle.

## IF YOUR SPORT-UTILITY RIDES LIKE A CAMEL AND DRINKS LIKE A FISH, MAY WE SUGGEST A COMPLETELY DIFFERENT ANIMAL?

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Rock Eagle and  
better gas  
 mileage.

ability of a horizontally opposed engine, the gentle cushion of an

Outback tames the  
sport-utility's brash

passion and the raw-

factored reaction of All-Wheel Drive.

Of course, the Outback has also been bred for protection, with increased safety features like dual air

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The Beauty of All-Wheel Drive



Product shown is a 1998 model year. Ground clearance is approximated under suspension load. Fuel economy: 1998-99 estimate. Pricing based on 1997-1998 model Outback 3.0 AT and 1998-99 model Outback with optional air suspension system. Standard tire load limit corresponds to 1500 lbs. (1300 lbs. for Outback 3.0 AT) except for 1998 model Outback with optional air suspension system. Standard tire load limit corresponds to 1500 lbs. (1300 lbs. for Outback 3.0 AT) except for 1998 model Outback with optional air suspension system.

PHOTOGRAPHS BY DAVID SABRE

## Building blocks

**Because of the striking transparency of this new material, the manufacturer of glass block is a highly automated process.** PHOT. DA



**Ingrediants are loaded to a 3,000-degree furnace in a belt-feed tank. Then a heating or "soft" of molten glass, above, is cut off and dropped into an open sand-bath.**



**After a plunger with a polished face presses the viscous glass into the shape of a hollow cube, then lifts it free of the mold. (The rest of the mold, the block's exterior, is smooth.) As the hot blocks move down the assembly line, their edges are heated to approximately 1,000 degrees before the two halves are mated in the sealing machine, above, which leaves the glasses and drives sand out of the air. Below the machine's insulation, the halves were joined with heat, which set the sand until the temperature in the block's walls after a return to the air, an annealing process that reduces the residual stresses in the glass. The block's edges are coated with paint #1 with a pencil that keeps the block from sticking.**

slabs prevent the steady 110-volt Victorian blower, shedding light from floor to floor.

The first stackable, hollow glass block, made blown into a mold, was produced by Geneva Pocelain in 1846. But it wasn't until the mid-1930s that Pittsburgh Corning preferred the hexagonal stacked "prism" block and today Depression-era architects embraced the material as a symbol of purity, radiance and a better tomorrow—not to mention an inexpensive way to assemble old fashioned facades. Between 1938 and 1948, 20 million blocks were sold. But as the '40s edged into the '50s, sales began to slip. The glassy orb of the industry would suddenly looked out of fashion, deemed suitable only for plugging basement windows and firebox walls.

Declining demand that drove one glass-block factory after another in the late 1970s, Pittsburgh-Corning, the last manufacturer in the United States, announced it would cease production. A cry of protest went up among prominent relatives—Richard Meier, Charles Gwathmey and Robert A.M. Stern, to name a few. Their last-ditch campaign succeeded in reversing the company's direction. At the same time, plain block got a boost from the TV hit *Madame Tussaud*, which featured historic Art Deco and postmodern buildings. Demand began to grow. Now homeowners, armed with how-to videos, drive away from home centers with stacks of the stuff.

Because real insulating windows, as well as stayaway midglights, are still the most popular fireproof windows. Other uses include dividing walls, exterior windows, shower stalls and kitchen islands, as well as the occasional aquarium stand, platform bar base or barbecue pit. For the decoratively oriented, glass-block makers supply fancy shapes, added tint and whitewash patterns like "Snow" and "Spring."

Glass block makes windows 10 times more likely to leak winds or rainstorms—tests show its quarter-inch-thick inner walls can withstand the blow of 250-psi shot out of a cannon at 60 miles per hour—but, curiously, it is not a fire-breeding material. The Don't Burner website thinks in a framework of wood.

The below measure provides some modulus, but glass block is not a stellar energy saver; the R-value of a 12-by-40-inch assembly of 4-inch-thick blocks is about that of a similarly sized double-pane window (E 1-96). "We



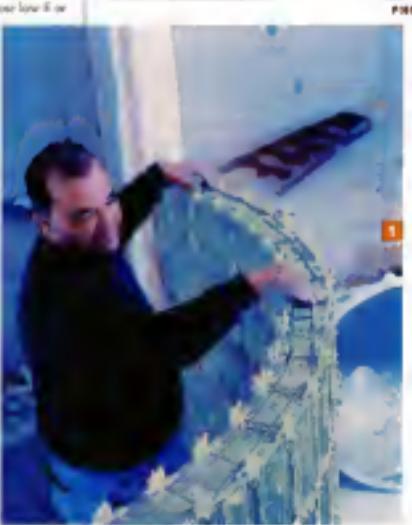
All glass block is not created equal. The LX block at left has a fibreglass mesh coated *versus* the regular to improve energy performance, making heat gain and muffle noise. The Vera Brick, right, a solid 6-inches-thick slab of glass weighing 10 pounds, is made for demanding structures. It will withstand a 1,000-degree fire for 90 minutes and rates a 2075 magnification. Thus, it is 25 percent thicker of insulating glass than Rutherford claims.

can't compete with those low R or triple-pane windows," says Pitts.

Brick-Crossing system engineer Nicholas Loosanoff, "but glass block is a lot less expensive on a square foot basis." Solar gain, the heat trapped from the sun, can be mitigated with large glass-block walls. Tight perimeter diffuse light and lime-haze glass bring out more translucent styles.

Choosing the installation method is as basic as comparing peeling, color and pattern. Chris Patterson of Steely Glass Block in Miami is a master peeler—"it shows that the wall required some workmanship," he says. Masons in the New York area charge about \$35 a square foot to install standard 8-by-8 inch block in mortar. (Steely, the block costs about \$4.88 apiece, including accessories, or \$39 a square foot.)

Most factories also make installation systems to do it yourselfers. Pittsburgh-Corning's Kwik 'n' Easy system, for instance, uses predrilled pilot holes for splicing and a silicone sealant to attach the joints. Patterson's firm prefers its clarity and strength, but Patterson claims it's tougher to install than it looks. "I get a lot of calls to repair jobs where a homeowner is standing by a pile of blocks with silicone stuck all over them," he says.



**1 The tile is an option, but installing glass block isn't like tiling. Above, an amateur Herman Pausch demonstrated what he put up in a shower unit.**

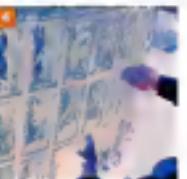
**2 The blocks can't be cut—they shatter if punctured, they can't be sharpened, and every third square needs grouting.**

**3 Steely Glass Block offers glass block in three sizes, a standard 8-by-8 inch block, or two smaller blocks, both in two sizes. The smaller blocks are the most expensive because, Herman Pausch says with a smile, plastic spacers that support the blocks and leaves a consistent joint width. "With 8-inch, I can do an eight-foot wall in one step," he says.**

**4 After Herman places mortar on the horizontal joints and sets the spacers, he formats a thick layer of mortar on one side of a block. 5 He presses the block firmly into place. The thick mortar interlocks joints in a consistent manner, he says.**

**6 When the blocks are set, Herman waits for the mortar to dry or when the blocks are dry, he adds a thin layer of mortar with a trowel and trowels it in to keep the blocks with 8-inch steel reinforcement.**

**"But how it shatters!" he says.**



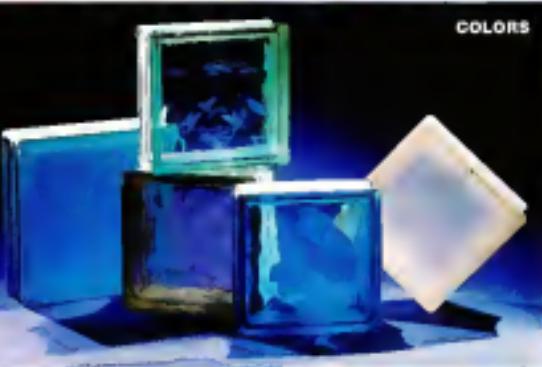
## Glass menagerie

In Depression-era America, when glass blocks flourished, there wasn't a wide selection to choose from. The monotonous blocks never available in one shape (square), two principal problems (an undulating wave or two sets of ribs instead of right angles) and one solution: the glass blocks became in the trade.

But the creative block that thrived in the 1920s and 1930s disappeared in the 1940s and 1950s. Instead, it's the 1980s, thanks to architectural innovations and more timely adaptations. Decked-out marketing pushed as decorative pieces in kitchens and baths, and the new applications opened a diversity of colors, shapes and patterns. Says Wiers:



### PATTERNS



### COLORS

caption: There Section, "Twenty-five years ago, a building renovation might have had a couple of pieces of glass blocks, now it's a series of windows."

Today's glass blocks have rounded corners, bulbous ends, bulbous ends and irregularities for complex installations. Although the traditional were odd-shaped patterns still dominate, glass block's resilience has brought "designer" colors, colors related to studio art, art nouveau, art deco, mid-century, etc. and stained. Glass block won't have anything to do with these purveyors: Kosta Boda, whose 1980 blocks were built only with crystal block, should be easy to basic wave design.

Surprise features make listed blocks, which are infused with metal oxide pigment yields this, unexpected purple and violet.

Indeed, traditional white blocks remain dominant. However, glass blocks with low-lead, "white" and "clear" are also in vogue, says Mark Wiers, director of all-involving Client Block Company to high-end German and American blocks, with green glass.

Glass blocks' re-birth and transmigration have left the industry racing to update product. Warren Wind, vice president of a German block distributor in the United States, sees mostly on a Select off the radar screens. "With the wider range of applications, the variety shouldn't be as low next year."

—Peter Ehrman



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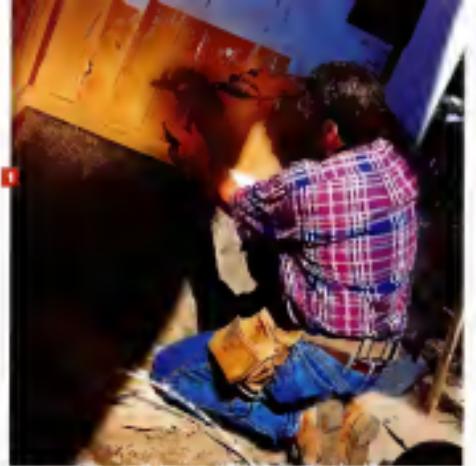
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(See Remodeling, page 118, for details and directions)



For the first one, Bunn walks up an embankment of land, then grabs shingles. Once covered there with another course using a-grade shingles, he makes sure every joint under successive rows is overlapped and is at least 1 in. from the one above it.



less, so that any point on the wall is covered with at least three overlapping layers of wood.

To get consistent spacing between courses, Shuglen uses a very pole, a kind of game yardstick.

Instead of inches though, it's marked in increments of how much each shingle will be exposed. This simple layout device, made of the pole, eliminates guesswork and expensive measuring.

To make use, Bunn lays a straight length of 1x3 across alongside a window, upper end butted against the fascia board (the first piece just beneath the eave), lower end resting below the wall. He marks the top and bottom of a window on the pole, which divides it into three sections. Then he divides each section by the shingle exposure he wants—in this case, five inches. If the window is 48 inches tall, for example, 12 courses will align with a top and bottom.

Shuglen seldom gets that lucky. When wall sections don't divide evenly, they'll hold no eighth of an inch here or there or get a full exposure above and below the windows and under the fascia board. Any fudge they make, they mark on the pole.

To begin this job, Bunn holds the pole against

the fascia board and measures the shingles to the course boards. At the start of each row, he marks a chalk line over the previous course of shingles between the marks on the course boards. Then he takes a grade pole, roughly 16 ft. or the wall, so its top edge sits at the chalk line. All he has to do now is rest the shingle butt (the shingle edge) on the chalk with one hand and nail with the other. It's faster and more accurate than aligning each butt with the line.

But on the first

course, which extends a couple of inches below the wall, there is nothing to keep a chalk line against or nail a shingle near each wall corner and in the center of the course so on both hangs, down two to three inches lower than the first course.

This provides a surface on which to snap a chalk line and nail the shingle. After the first shingles, he marks a horizontal grade streak makes it easy to follow the chalk line. Home Inspect. While easier shingles tightly against each other, as the wood dries, gaps will open up.



Every pole in hand, Bunn marks the location for the next course of shingles. A story pole ensures that courses will have consistent spacing around the entire house.

course is finished and the shingles are nailed up, he just walks and strips off the tag end.

On the first course and most windows and doors, the shingling is doubled—one course is nailed directly over the other with no exposure. Doubbling means joints are covered so water doesn't reach the wall. Above windows, doubling also builds up thickness so shingle slope is consistent throughout the course. Lastly, low-grade cedar shingles make shingling underneath a迎面 (overhang) or eaves, premium A-grade shingles are the rule.

Whether nailing with a carpenter's hammer or a pneumatic nail gun like that used by the Narragansett crew, a shingle plan two 30 11/16-in.-long galvanized ring-shanks made into each shingle, about half an inch from the edge and high enough about the butt in the next course to cover the shingles.

Bunn works from the eaves to the middle of each course. He selects wide and narrow shingles as needed to keep the joint between shingles at least one inch away from the joint to the row below and to prevent points from aligning within any three courses of shingles. Each shingle is passed singly against its neighbor. Gaps will open up as they dry, Bunn explains. To fit the last two shingles in a course, he overlaps the past course. The bottom one is with a utility knife along the overlap line and strips off the excess.

As a courtesy to Narragansett, the shingles on the project house are another painted over stained but late "to the weather," so they will turn the much-loved silver-gray. But



the shingles' finishing environment will soon turn down to about half their original 1/8-in. thickness in 20 years or less, when they'll have to be replaced. In less harsh conditions, untreated shingles might last a century or more, provided with a coat of paint or stain, they may last as long as the house.

The shingles go up

quickly, to the rhythmic pop

of the nail gun, until they reach the windows. The gaps in the two courses immediately below the windows have to be tapped off to reduce the chance of water entry, and those that meet the eaves' projection ("joints" have to be notched out with a utility knife if they can't be stepped behind). The courses to eaves side get shorter and no courses meet

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# Bank Error in Your Favor

Collect hundreds—thousands—if your lender messes up your mortgage

BY LEW SIGELMAN AND PETER MILLER



For Stuart Rabkin, the check really was in the mail. Two days after his mortgage lender learned about errors in his account, Rabkin got a check for \$5,700. "There were no games, no nothing," says Rabkin, a Rockville, Maryland, business executive. "The company couldn't have been nicer." It couldn't have been a fuss. Because of the errors, Rabkin had been overpaying the withholding for property taxes and insurance for at least a year; the money was his. Yet he might never have gotten that check had he not responded to an ad for a \$53 excess-account audit. It may have been the best \$53 Rabkin ever spent.

Unfortunately, Rabkin is but one of a growing number of borrowers whose monthly mortgage payments have been altered by lender error and miscalculation. Loan accounts are sometimes fuliginous with errors—bunkers and even thousands of dollars that originally should be back in the borrower's pockets. Common mistakes result in two results: money being collected for property taxes and homeowner's insurance, as in Rabkin's case, or the interest on an adjustable-rate mortgage being set too high. Borrowers can also end up shelling out more than they should when payments for private mortgage insurance continue long after the coverage is avoided. Some lenders put money in the wrong place. Instead of crediting an extra payment to the loan principal, a given the income for taxes and insurance. A loan is particularly vulnerable to error when it is sold from one lender to another. For such a little vigilance and a calculation, you can protect yourself against blunders and recoup whatever you're owed.

Excess accounts are the easiest places to find mistakes. In addition to loan principal and interest, monthly mortgage payments may also include money to cover property taxes and homeowner's insurance. It goes into an *escrow* or "reserved" account from which the lender pays taxes and insurance. In the past, lenders sometimes collected more than was needed, presumably to cover insurance, but changes in federal law have put a stop to that.

Under the new rules, lenders can only collect enough money to pay tax and insurance bills and maintain a two-month cushion, plus \$50. Collections above that must be returned. Escrow accounts must also be analyzed each year, and borrowers must receive a 12-month projection of activity. In addition, some states require lenders to pay interest on the extra money they hold. But rules aside, borrowers should check statements carefully to make sure they square with their actual tax and insurance costs.

What it comes to keeping accounts, however, it's better that banks and other lenders aren't going to goof. But if you have an adjustable-rate mortgage (ARM), don't let down your guard. David Ginsburg of Lomax, a Germantown, Maryland, firm that



ILLUSTRATION BY JEFFREY WILSON

conducts mortgage and escrow accounts, says he finds adjustment errors in a quarter to a third of the loans he checks.

The most common ARM error is due to good math with bad numbers. ARM rates go up or down according to the movement of an index, such as the interest rate for one-year treasury securities. The loan interest rate is calculated by adding a margin—usually 2 to 3 percentage points—to the index. So the rate for an ARM with a 2-point margin would be 6 percent one year when the index was 4 percent, and 8 percent the next year if the index moved up half a point. Every thing works fine as long as the right index and margin are used, but they may not be. The lender could also be off schedule on the date the index must be set or actually a specified number of days before the loan rate actually changes. Index levels shift constantly, so if the rate is set too early or too late, you could get stuck with the wrong number and an undue increase.

When borrowers look at payment statements and do the figuring, it all may seem well, but you should still look deeper and make sure that the bank's numbers match the terms of your loan note. And make it a habit because it's not just the peer or the next that you're checking. An incorrect adjustment can run off a string of unpredictable debt consequences for the life of the loan.

Borrowers who routinely make extra payments on the loan principal should also be vigilant. Sending an extra \$50 a month to speed up the loan payoff is great—as long as the money really reduces

the debt. But a lender could mistakenly put that money into an escrow or a so-called suspense account. Money in a suspense account is not applied to taxes, insurance or principal. Instead, the borrower's cash just sits there—in suspense—until the lender moves it to an escrow account, perhaps to cover a shortage, or simply applies it to the loan balance because of other accounting procedures, some lenders won't credit part of payments until they add up to a full monthly payment. This can result in the money remaining in a suspense account for many months. And during that time the lender, not the borrower, col-

morts but can't pinpoint them, it may make sense to have your loan audited. For \$35 to \$275, depending on the loan's complexity and age, an audit specialist doesn't charge just a percentage—it will examine the complete loan history and find out if the increasing, rate adjustments, prepayments and all other activity have been properly accounted.

If an error is found, a "lender refund request letter" is prepared in the box covering along with the audit report, Ginsburg says. "This letter is sent out by certified mail with a return receipt and cites federal law requiring the lender to respond within 60 days or face a

\$1,500 penalty. But usually the whole process [from error to refund] is wrapped up within a month. We have never had a situation in which a lender refused to make an adjustment, never credit or make a borrower whole. It's either taken care of or not."

What if an audit reveals that the lender has made an error that resulted in the borrower underpaying for months or even years? The borrower will have to make up an excess shortfall but will probably owe nothing if the case of a negative rate error. "I have never seen an amount as 'incorrect' for the borrower when a lender discovered it had applied an interest rate lower than called for," says Mark McDonnell, head of The Mortgage Connection, a Needham, Massachusetts, firm that does mortgage audits. Many buyers agree that lenders have waived their right to the extra money. Looked at that way, you only stand to gain by keeping records and managing your money.

## Shedding coverage

Though it's usually not subject to write, private mortgage insurance (PMI) is a cost you may be able to eliminate. It's normally required for loans that are financed with a down payment of less than 20 percent. Borrowers can apply to the lender for a loan modification to remove liability to the insurance company and default on the debt. If the property is foreclosed and doesn't sell for enough to cover the mortgage, PMI pays the lender the difference.

If you've increased \$20,000 PMI over \$600 to \$16,000 a year, depending on the amount of the down payment and whether the home has a fixed (less stable) or adjustable (more stable) rate, Altera is a new firm of rating analysts and underwriting principals. The home owner's equity will often exceed 20 percent,

and PMI payments may be discontinued. But it's not automatic. A federal judge recently ruled that lenders aren't required to cancel PMI, even when because of the reduced risk and cost of loan that the insurance may no longer be needed. The right to apply to remove the insurance depends on value, and the \$200,000 cost will be compensated by a few months if the PMI is removed.

One type of coverage, lender-paid mortgage insurance (LPMI), isn't for stopped because the cost is still a higher interest rate. The interest rate is legal but will still be applied on mortgage balances, but even when there is enough equity. The only way to get rid of the coverage and the cost is to refinance the entire home, though dealing with the current lender might not get results.

levy interest on it. Review Form 1098 if you are paying it more, always fill out the pay stubs to reflect the extra amount and check the new mortgage bill to make sure it was properly applied.

Borrowers can also sweep out a mortgage when the lender fails to the note to another company. Defaulted debt is an asset that can be sold or traded, and a mortgage note can change hands more than once before it's paid off or refinanced. But again, borrowers beware. Defaulted monthly and annual statements to make sure the terms remain the same and aren't interrupted or altered by a new owner.

If you suspect problems with your

## M

y favorite This Old House projects are those that take their identity from their

surroundings. The adobe house we rebuilt in Santa Fe years ago always had Santa Fe, not Tucson or San Antonio. And it's hard to imagine a more appropriate place than New England for the timber-frame barn that Todd Benson put up for us.

This winter, we fled the shores of Boston for the desert landscape of Tucson, a town with a cast of houses that seem especially suited to their physical and historical environment. Tucson looks and feels like an old Western village right out of the movies. Stark dry mesas and arid washes separate census tracts up on top of slopes. You could point your horse toward the setting sun and ride right into a John Wayne scene, many of which were actually filmed at the old Tucson studios. But the town's deeper roots are Native American and Hispanic.

Our project house is a blend of all those traditions. The living and dining rooms are reminiscent of an old Western lodge. The house is organized around a central courtyard like a Spanish hacienda, and its style is called Pueblo Revival because its sloping, earth-colored exterior walls are reminiscent of the original Pueblo Indian dwellings. The architect's plan is modular, and a property like this could easily step out of control, growing bigger, more complicated and more expensive than intended. If that happened, the biggest danger would have less to do with economic than with design. The informal charm and sense of place that this house could so easily destroy. Jim and Colleen Moga, the homeowners who have lived here for 17 years, are not about to let that occur. Jim, an architect designer with many Tucson houses to his credit, has determined clear boundaries to this remodeling. For example, he has refused to remove the original bathrooms. He likes their finely-crafted tiles. And he has been equally adamant about keeping the original arched windows, even though a window manufacturer offered to replace them free of charge. Jim says his biggest challenge will be to keep the use of the new addition small enough that it won't compromise the original structure.

The Mogas are hardly naive that what makes their house special is a sense of proportion rooted in history and location. "We have an old Tucson house," Colleen says. "We want to keep it that way."

—Steve Thomas



A framed recessed bookshelf, hidden well, will spruce up the cozy old Adirondack room, entertainment center for the Mogas.



Project contractor John McQuade with Jim and Colleen in a Tucson basement where they keep Tucson's desert climate.



Long and low-slung sofa and chair become a part of the new sunroom, but a pit tag passes free fire but will be filled in.





**O**pening soon, our newest location: Saturn of Yokohama.



With all the people  
packed onto an island,  
there is not something  
folks in Japan have a  
lot of. Needless to say,  
there are some pretty  
tight spaces: parking or  
parking spaces. We've been

told our dear Japanese  
customers just as well as

we are: there's the car  
market will be the biggest  
selling point. Literally.



When you buy a car in Japan,  
the salesperson takes time to  
get to know you. Pleasantries  
are exchanged. Questions are  
answered. And never, ever is  
the buyer put in a position of  
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our decision to send Satellites to Japan, we had  
to focus on many cultural nuances. Like moving  
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on the radio. Even shortening the turning  
radius for those narrower streets. As for the  
way we sell Saturns, however, we found that  
we didn't have to change  
much at all. Respect, it  
seems, translates no problem.



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Unbelievably everyone in Spring Hill is pretty excited with the  
idea of having a going to Japan. Or, as somebody over in Central  
Florida put it: "It's going to be a great idea! Because those  
shops are going to be Japan flooded, instead of empty" down

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Terence Blanchard's the adobe house.



A small living room, but big enough.



Marin has a sense for art.

# RAISING ARIZONA

The crew from *This Old House* takes a Pueblo Revival home in Tucson to a new level of livability

METER MORTENSON, ARCHITECTURAL DESIGNER JIM MCGEE IS UP AT 3:30 AM OUT IN HIS BACKYARD STUDIO, DRINKING coffee and sketching plans for other people's houses. As the sun comes up, he can see brown mountains, the spiky gray-green plants of his own one-acre out-of-downtown and an occasional roadrunner or coyote passing by in the sharp, clear light. Invariably, the Santeros finds it easy to let his designs. McGee rhymes with egg; loves the relaxed, somewhat sleepy atmosphere of Tucson. "It's a big small town," he says. One of the oldest continuously inhabited settlements in the United States, Tucson, now a city of 600,000, looks southwest toward Mexico 60 miles away. The city sprawls through a valley surrounded by low mountain ranges, with long fingers of

BY JACK MCLINTOCK PHOTOGRAPHS BY GARY BURRIS



Terence, left, and Jim, right, are both involved in the creative process.



In the old "Arizona room," the fireplace is the big.



The sun-baked courtyard is the heart of the house.

development stretching out from the glinting peaks of down-sun high-mesas to the dusty foothills. Colors are bright, sending every oval Cooke intricately with shades, and summer is hot ("But it's a dry heat," a bumper sticker wryly points out). Rivers and creeks are dry most of the year. Yet there are two rainy seasons—one from July through October, called "the monsoon," and a number in midwinter—which often bring flash floods that send roads into sudden spurs. The surrounding

## Hiring an Architect

The Morgans feel squat, mostly two-decades thinking about what to do with their house. But when it comes time to turn their plans into reality, they wanted a second opinion. "When you're the buyer and the architect," Jim Morgan says, "you're so close to it, you can't see the forest for the trees."

For a local perspective, he turned to Alessandro Maggi, a Tucson architect with whom he's worked on many big projects. "I've come to prioritize the job and tools of the budget," Maggi says. Maggi quickly determined that the **Wells Fargo** (\$100,000 budget result): "After tearing down the garage and replacing it with a new, longer one, we'll have this old garage."

San Diego Bay or crossing the Sea of Galilee. Or he might ponder the renovation of his own house, which he and his wife, Colleen, bought in 1978 and have been thinking about

## THE MASTER PLAN

New addition and spaces slated for renovation are identified in **yellow**.



#### САМОДЕЯТЕЛЬНОСТЬ ВОЛОНТЕРСТВА В РОССИИ



Johnnie Hayes,  
otherwise mentioned  
as "John Hayes" and as  
"John Hayes" in  
John Hayes, Hayes  
and Hayes, steps,  
"John and I think  
a lot alike."

The *Recipes* feature in the desert environment is usually a living participant, with a fountain and pots of green beans being presented in a central oasis. Please the diners here to see the desert in a new light, which you can't get out from the pots and plates class by Arnold Hart Alexander Hayes. To the left in the rear kitchen, another kitchen, to the right, the main menu; walls from the front patio. Pansies dress up a bit the dining room. The *cooking* right: Kitchen adjacent to the dining room will be expanded to accommodate a new *energy* section, which will be Jim Blagg's small studio with easels and chairs leading to a writing patio. The media room will have a new *paramount* screen, and doors leading to the old master bedroom, which will become a library. The new master suite will also serve as the library.

encrusted cut back, with a dentilized set in the corners. But children came, there was work and selling, and he never finished the job. The converted 12-masonry columns still stand, giving the porch a solid, unfinished look. Freudenthal's rule about Meigs's "Something."

For years, whenever deep discounted the house, Jim and Colleen would find themselves overwhelmed by the various pros and cons, and finally Colleen would say at breakfast, "Well, at least let's do the kitchen." She faulted the old cooking was. Jim and David (the results of a double knee surgery and a childhood malformation) had only made the kitchen more dingy and unconvincing. The counters were narrow, the cabinets shallow, the tile cracked. Still, renovation got postponed. Jim worked; Colleen looked after Elizabeth, now 12, and James, 11, and did some fabric design and volunteer work. They all wore cycling.

Now, with the help of the The Old House team, the Mingeys' plan for refurbishing the house is finally being realized.

Steve Thomas and Noemi Abenszur came to Colleen's studio—"a country neighbor based in the center of the city," as Jim Mingeys calls it—one morning in early December for an inspection. The sun-kissed house is a series of rounded volumes with a flat roof and thick, stepped parapet walls. Built in 1930, it is surrounded by mature magnolias, palmettos, prickly pear, cacti and century plants. There are three bedrooms and three baths, with a separate garage, studio and guest quarters out back, all originally enclosed in a hodgepodge of tile in the style of Spanish Pueblo Revival, and it resembles the familiar Santa Fe pueblo, although it lacks the prominent round towers, or *casas*. There are also Spanish Colonial features (arches, tilework, the round-

## pacifying the killer bees

Steve Thomas is in the bathroom roof, a bee cell on his hand and a dinner knife in his hand. There's a buzzing in his nose and mouth at his voice because the bees are, Terry Kline, is including the bees—no more bees. Insects are eating his health and the bees continue.

The first time a swarm of the Mexican Bees flew five years ago, they got to know the man who built in the adobe-style. But then Africanized bees invaded the bees. They work as aggressive—like eating Colleen on the face—but "you could taste them hitting the windows," Jim recalls. When they started swarming out of the eight fixtures in the middle room, the family moved out and the exterminators were summoned.

European settlers introduced bees to the New World during the 1600s. Now there are 3,000 species in North America, and a third of our food crop depend on them for pollination. Bees will live in certain, make honey for food, reproduce until the colony is overwhelmed and then swarm. The queen leaves off with 10,000 or 15,000 bees creating a new colony. European bees were do this in March, April or May, but Africanized bees



three off foot at the creation a year and one is extremely dangerous. Like firecracker's monitor, the Africanized bees are well-tempered scientists. Generalissimo Wimberly Kline is right there to teach in 1989 thinking they would impinge on the Mexican bees, which are about a little honey, and the European bees, which die in the first stages. He set his African queen in hives, hoping they would hybridize with the Europeans. Instead, they escaped. Twenty-six queen swarmed and began moving north. In route, the bees have killed at least 800 people. The first Africanized bees were seen in Texas in 1989. Two years later, 50 percent of the bees there were Africanized, and by November 1990, that number had risen to more than 70 percent. "Now people don't even want to see what kind they have," says Kline. "They just eradicate them."

When the Mingeys moved in, they were advised to hire a pest control specialist, and they did. The bees were in their first year, though, with many and nesting with bees. Kline says he hopes he can get the queen, it will be easier to keep her away from the bees are Africanized or European. "A lot interesting," Kline says, pointing to the names drawn from the nest.



adobe brick can delay temperature changes for as long as six hours. Inside the house are wood floors, corral ceilings and white plastered walls against which hazy dark escape human contact dramatically.

"The house is basically in good shape," Steve says after a walk-through. "But it is the poor where it really needs what we're going to do."

The judgment was reached by a professional inspector, Alex Blakes, in a 45-page report. A revised estimate coming on the house—what project manager John McClellan called "the most awful of the Southwest"—was pending off or about. The porch's pine beams were rotted halfway through. The floor in Jim's studio was water-battered. Electrical wires ran roughly up the downspout and across the roof. Vinyl-Grip had to fix valve leaders in two bathrooms. Rot infested a pine roof outside the kitchen door. There were broken light fixtures, cracked tiles, loose firebrick in a fireplace and possible exterior damage. What's more, a three of base had settled in the root of the corner bath, and had drooped down and stained the walls yellow.

Unfazed, Mingeys called the low-end man. He knew many repair on the house was long overdu, and he had deliberately waited and the work could all be done in over. But, he acknowledged, "It's gone from a renovation to a restoration."

There are three main projects creating an indoor-outdoor kitchen, building a new master suite and finishing the basement. With each, Mingeys wanted to maximize the buyer's positive feeling, so he had begun doing that first year by building the porch. "We're going to make what's here," he said, envisioning a single entrance. Elizabeth had always wanted a bay window in her room, and her father had decided that, although it's not exactly fit the adobe-style of the house, she would get one now—"A Pueblo Revival one," he said with a smile.

The first priority was to do something about the leak in the bathroom roof. For Terry Kline, the bee exterminator, got to work, with Steve Thomas's nervous help (see page 66).

As soon as the bees were gone, McClellan and his crew started by tearing off the old master bath to make room for the new master suite. Jim had always thought the bath was a 1930s addition, but research found a 1934 Tucson newspaper under the tub. The old master bath was to become a library, a quiet room for Colleen and Jim, and a hallway gallery for family photos would lead to the new room.

Designing the addition was a challenge for Mingeys. An admirer of Frank Lloyd Wright, he often insisted that "proportion is architecture when inci-

gious and Jim Mingeys take a million break with Morris and Steve on the porch, which they added to the house 17 years ago.



## Here's to You, Mrs. Blimpington

There's a pit in the Mexican brick-patio where Kline once intended to install a hot tub, that's off the hot tub—generating. But they never got around to installing one. In the doorway, side by side, are two of the reasons. One is a tricolor, a three-colored Goshen 840, resting on a trailer and ready to be loaded off to Mexico or the Gila-mile coast. And Jim Mingeys' what the family likes to do for fun, and he says, "Selling, walking, and hiking."

Also in the drive, just inside the house's ground floor, is an impressive playhouse—large and hand-built by Jim Mingeys, grey-shingled and hand-painted like the house. Colleen and Morris made these for their children's imagination on Christmas. The playhouse is designed to double as a garden shed when the door is open, revealing a secret garden space, surrounded by the studio and workshop. "What's her name?" says Dorothy? Mingeys thought fond and fondly. "She's for Mrs. Blimpington."

"Mrs. Blimpington" is dead but the dining-room window and over the piano—shimmering, shiny, slightly shaggy and polished, reflecting in the window with a big red heart on it. That's when she discovered she was Mrs. Blimpington.

It took several additional flights of youthful dreams, the playhouse—symbolized that's reflecting across of family. As for the hot tub, they haven't gotten it ready thought her peers. "Goshen building just isn't in our vocabulary anymore," Jim says.



Peasterka the porch, Mrs. Blimpington's pet.

## Hola, Linda Ronstadt

It was the year before the arrival of the Great Depression, and Tucson's developers had begun to see that the Southwest, promised an enchanting haven. Thus a house for the elite, might attract a well-used with affluence. They were right. One of that project was Glendale Estates ("finest estates"), built out in 1930 by Stephen Child, a Boston landscape architect and proctor of planning law pioneer Franklin Law threaded. The lots were large, at least an acre, and the houses, like the ones in the 1920s, mostly Spanish Colonial Revival, but two are rustic Revival (one is the Migueles). Linda Ronstadt, a Tucson native, has a house there now.

Child's design preserved the desert landscape, like desert curving to the most commanding natural feature, Arroyo Chico, a meandering stream that in dry arroyo floor the Rillito bed comes with seasonal downspouts. Today, the arroyo is lined with mesquites, acacias and willows—100 desert-adapted species of plants, started by 191 species of birds as well as dozens of snakes, lizards, jiggers and arthropods. Instead of culverts to store the water under the streets, Child created "Arizona drys". The streams simply flow like the gullies and eat the streambeds again, carrying natural inputs. The arroyo still has a few more outcrops, the country music. Driving along them, you'd be hard to believe this is in the virtual opposite corner of a city of more than half a million people.

The problem was how to pack 1950s living into a 1910s space. Jim wanted a bedroom that was appropriate to the scale of the house, which was built when rooms were smaller. Giffen estimated a room of more generous size. It was partly to help find a compromise that the couple hired an architect, Alessandra Hayes (see story, page 44). From his own professional experience, Jim knew how useful it can be to homeowners to have an informed mediator. And he knew Hayes was tactful, as well as a gifted designer. With her help, the Migueles found a solution, the first of many.

The kitchen presented another challenge. It was too small, but there was, once again, the problem of proportion. Pueblo houses didn't have big country kitchens with skylights and food-preparation islands. How to enlarge the kitchen, add a 1950s cushion-loving composter and accommodate Giffen's idea of how it should all look? The challenge, Jim said, was to create "a radical departure but make it believable."

At the south end, a new load-bearing wall separated the kitchen from a utility room. Removing the wall would almost double the kitchen space. There would be room for a range and Viking range, dishwasher and refrigerator and plenty of cabinets. Instead of conventional upper and lower cabinets, the couple asked craftsman James Ronco to build only lower cabinets in front of the kitchen, with an additional full cabinet wall. They asked him to build them all of mesquite, a slow-growing, hard, heavy and beautiful local material that was becoming rare because of subsistence to gathering for barbecue firewood. When finished, Ronco's work would resemble fascia against the white set for the same look Giffen lived off these living zones. And Migueles had pre-readied platters. Giffen, Clavesa to come on of refinement to plates all the interior walls, including those in the kitchen, to match the rest of the house.

But what about the kitchen's outside companion? Tucsonans spend a lot of time outside, and the Migueles wanted the perfect place to entertain. "It has to feel like part of the original house," Jim said, "but relate the inside to the outside, which is a recent concept."

Just outside the kitchen was a little patio with a few walls, a gate and a perimeter roof. It was adjacent to both kitchen and courtyard end, because it was original, its proportions were perfect. It would be the outdoor portion of the kitchen, with pointed-toe concrete countertops and a new limestone fireplace on the corner installing French doors.

## PROPERTY SPOTLIGHT

PROPERTY SPOTLIGHT: 1000 N. 10th Street, Tucson, Arizona. A 1910s Spanish Colonial Revival house, it is in the center of Tucson's most historic area, in the shadow of the mountains. Price: \$1.2 million. Contact: Jim and Linda Ronstadt.



Jim works on the exterior in relation to nature to make room for the new interior.

between the patio and the outdoor kitchen would create the perfect indoor-outdoor space for cooking, dining and entertaining.

Another room illustrated how the use of space changes as social habits and technology evolve. Many Southwestern houses have what's known as an "Arizona room," a sealed, partly walled porch, mostly open to the outdoors and often set in the cap of a U-shaped house. The Migueles' Arizona room had been enclosed, possibly in the 1960s, with aluminum windows and paneling that looked, Migueles said, like "tinder siding." When the couple moved in, they took out the windows and siding, raised and tiled the floor, added big tempered glass windows, built in planters, bookcases and a bone-white fireplace and surrounded the walls. With TV and VCR added, it became a media room where the family spent many desert evenings watching the fire.

But today, in Tucson even the fireplace seems too big and the tile floor and bookcases more Spanish than Pueblo, so the plan is to palliatively cut the tile and make a new floor of a traditional Arizona stone, travertine, fired-poured concrete. The walls

adjacent to the fireplace will be torn out and plastered, thus reducing the fireplace's scale, with tiles on the plaster replacing the heavy, dark bookcases. Thus, Migueles says, he'll be creating a previous owner's mantle as well as a few of his own.

Early plans called for a new garage, which was situated on the grounds of cost. But they would move the laundry inside from the garage, update the mechanics (by switching to energy-saving, gas-fired "chiller" with only three moving parts, which would cool the house using a water ammonia loop) catch up on maintenance (again the cost of electric), and give the place a total firelift. Then left for shelling off the courtyard, which would be fully straightforward: paved concrete underfoot, glass-tiled-around-brown overlead (the eight-year-olds Jim had used on the front porch 12 years before were hard to find now) and a lot of green in the form of the fountain for a trash, or other, uses, of garden lattice. "The house will have a cool interior, a cool and compact and a well-insulated from the dry, sunny environment outside," Steve Thomas observed. "It will be a true desert house."



# adobe, the magic mud

You can Huff and you can puff, but you can't blow this house down

BY PHOEBE LEMLEY PHOTOGRAPHS BY MICHAEL GLEWELYN

THE WALL, MARSH AND DEFENSIVE ROADST  
the endless Arizona sky, could be part of a  
Zuni pueblos dwelling, circa 1500. Stucco  
mud-plaster, clay-colored adobe blocks and  
mortar rippled with bits of wheat straw  
give it an air of venerable, dignified  
strength. There's just one small anomaly:  
no main entry box about a foot above the  
ground, packed with cooled blue wren.

"That's a high-speed computer line," says  
general contractor Michael Korb. "The  
client is a writer, and he needs a state-of-the-art  
data connection to the Internet."

This wall is part of the future Tucson  
home of David and Debbie Hardy, and it  
brides the couple's design needs. While  
David, an orthopedic surgeon and author of  
medical-journal articles, needs high insula-  
tivity, Debbie, an ardent preservationist,  
says she wants the home "to look like it's  
been here for a hundred years." She's done  
that by selecting an old adobe-style  
style, Sonoran, featuring a tiered-like massing,  
an interior courtyard and a wide arched  
hallway called a *casita*. Adobe—heavy,  
gritty and real—is central to her vision:  
"Look at these blocks, isn't they  
magical? They appeal to me, they  
inspire...It's just good old dirt."

The Hardys' house, in Tucson's historic  
Historic district, is a prime example of how a new generation of builders who  
work with adobe is successfully melding  
this ancient building material with  
advanced electrical, plumbing and climate-  
control systems to create hybrid structures.  
An adobe revival that began in the South  
west in the late 1980s appears to be gathering  
momentum. "Adobe makes sense in  
the modern world," says Bob Vila, the  
Hardys' architect.

The advantage of adobe  
interior walls is to create an  
isolated look while insulating  
modern building needs.  
Plus, for instance, painted over an  
existing floor, it creates a smooth  
David and Debbie Hardy's  
future home, is purely  
representative. A massive feature  
of concrete and adobe will be  
the central atrium & its lower  
level of adobe blocks.

## BRICK BY BRICK



MASSING contractor  
Eric Illinois lays the  
first course of adobe  
blocks on a concrete  
base stem wall, 8  
feet high. The adobe  
is elevated to prevent  
water intrusion.



Adobe blocks vary in  
size and require lots of  
mortar, which is applied  
with short-handled  
shovels, not trowels.



A massive scale the blocks,  
offices. Then, when  
they look and feels to  
squeeze out gases in  
the mortar, below.



A big factor in the resurgence of adobe  
has been the insulating quest for energy efficiency:  
lessening the need for mud blocks are  
terrible insulators—a four-inch block from  
just R-8, about the same as an inch of  
cylindrical insulation. But "there's more to  
energy efficiency than high R values," Korb says.  
While an R-12 polystyrene-insulated  
wall resists outdoor temperatures

To ensure the structure will be load-bearing, masons place them lengthwise at 45 degrees, a 10-inch-wide angle that's about the width of the blocks.



resistance, a adobe measures them. Because it's so dense, adobe heats up and cools down much more slowly than the surrounding air, so the blocks stay fairly close to the average outdoor temperature during a 24-hour cycle.

"While outside you've got a swing from 70 to 130 degrees over 24 hours, inside you're going from 40 to 80. That's a big break in cooling bills," Koch says. He believes a decent house that makes intelligent use of adobe's heat-modulating ability could keep cool enough temperatures between 75 and 82 degrees with no additional heating or cooling. Indeed, he's designing such a home for himself.

Blocks made from stacks of sun-dried bricks of mud and straw have served desert landscapes worldwide for thousands of years. *Reader's 5x5* details how the Iremes, experts in Egypt, were flagged for failing to meet their profusion quota of straw-concentrated bricks (Sobek) imported by voting big, mosquito, bird and locust plagues on Pharaoh.

Fortunately, adobe blocks were made on site—simple, efficient, work. The method: Dig a shallow depression in the adobe of the house-to-be, fill it with water and straw, mix, shovel the mud into wooden brackets. Repeat a few hundred back-breaking times and you wind up with an adobe house complete with cellar.

But today, even adobe brick is no longer as manually accurate and are content to purchase blocks and have laborers place them. A major drawback of adobe used to be its tendency to rot in rainy mud when wet. So adobe improvements, water-shedding adobe bricks have been popular since the mid-1940s. More accurately, cement-stabilized versions have been cropping up, and that's what the Handys chose. Unlike unplastered bricks, which have a dark hue, "the looks like the original adobe but is also terra," Julie Handy says.

A partner might argue that such fortified blocks aren't really adobe—but typically, these add-ons comprise 6 to 8 percent of the block's volume—dark slabs not cited the percentage of cement in concrete blocks. Although adding concrete to an adobe doubles its compressive strength, the available blocks measure fairly crumbly compared with fired ones. The reason on this job are solid blocks by simply whacking them with the edge of a crosscut.

And although they won't melt, they will absorb water. To prevent flooding during Tucson's occasional thunderstorms, the exterior walls must be protected by large overhangs, or coated every five years with a breathable water repellent such as modified stearate.

Small adobe houses have now lost an entire side of the adobe bricks. This creates a form for pouring and reinforcing the concrete beams.



Measuring out a section of 10-inch-diameter reinforcing steel (rebar) between two 8x10x16-foot columns in the 8,000-square-foot adobe house, the concrete blocks, which in turn rest on a layer of brick, reduce a paper. The paper acts as a bond breaker to prevent the expansion and contraction of the concrete beam from stressing the concrete above it.



Rebar to all concrete are poured into the cavity in form a steel-reinforced, 8x10x16-foot concrete beam. A smaller concrete beam (inside the angle iron) is poured of the top of the all every will in the beam.



But typically, these add-ons comprise 6 to 8 percent of the block's volume—dark slabs not cited the percentage of cement in concrete blocks. Although adding concrete to an adobe doubles its compressive strength, the available blocks measure fairly crumbly compared with fired ones. The reason on this job are solid blocks by simply whacking them with the edge of a crosscut.

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Because the raw material—mostly desert earth—is locally dirt cheap, the blocks cost somewhat less than the lumber, drywall, insulation and siding of typical frame construction. The building process itself is often cheaper as well, particularly if, like the Handys, you choose cut to plan over the blocks. "When the workers lay the wall, they are doing the structure, insulate and exterior finish at one operation. You don't have different crews coming back day after day," Vick says. The Handy house will come in at \$93 per square foot, up to 10 percent less than equivalent custom-designed frame houses.

Much of the cost of building with adobe is incurred in hauling the requisite quantity of blocks to the building site and transporting them on place. The walls of a 2,000-square-foot mud-brick house weigh about 10 tons, those of an equivalent adobe dwelling weigh a house 336 tons. That weight, Vick says, means adobe structures are best confined to one story. But it's this mass that insulates adobe, according to Vick. "It even requires large, leafy shade trees construction up to the adobe without problem. "I have an emotional attachment to adobe walls, as opposed to walls that you sweep out and it sounds like you're hitting a drum," says Vick. Meana, head of the masonry crew.

In modern adobe work, the walls are even stiffer than they seem. Traditionally, the foundations of adobe houses were simple trenches filled with rubble, and beams (the structural supports over doors and windows) were plain wooden beams. But to save cost, as the Handys' new home means poured concrete foundations and load-bearing Spanish walls with an extensive network of massive reinforcement. The西班牙的, concrete-packed floor levels jutted down from uncut and demolished Tucson houses are purely decorative. The real support is supplied by a formidable ring of single rows, steel bars and concrete just above the wood, a hallmark by a series of four inch-wide adobe blocks. "We've been trying the adobe wall just to have the house for a bomb shelter in case of terrorist attack," says Vick.

Still, building an adobe house in the '90s requires adapting to its ancient work rhythms. Usability of brick sizes requires vast quantities of mortar to be mixed on site, as adobe will is about 20 percent mortar. The ubiquitous shovels among the dozen Spanish-speaking workers on the site. "Más mortero!" ("More mortar!") ("Más mortar!") The act of housing a 32-pound adobe brick and raising it in a place isn't much quicker than it was in the days of the captive Hacienda. And there is the endless repositioning of scaffolding so that the masons can place the blocks at a comfortable—or, at least, not crippling—height.

"At the end of the day, these masons get hairy," says Vick. He's been doing it for 30 years, slaking a gold-toothed grin. "I'm getting too old for this. I've been saying that for 30 years." But, he adds, staying a day's work, "It's a beautiful stuff."



## BUILDING BLOCKS

**Native Americans** using its adobe structures reserved for the masonry's remarkable thermal mass, which is especially appealing as an alternative to wood or steel joists.

But modern-day homeowners aren't so accustomed to large adobe walls. The first adobe houses in modern construction require, as a variety of additional and manufactured approaches have been devised to make adobe more durable. The first developed types of adobe in use date from 1948, from Tegu.

4. **Reinforced adobe.** Most adobe blocks are reinforced with a steel mesh, which is usually held in place with a concrete mix. They are usually held in place with a concrete mix.

5. **Reinforced-block adobe.** Mud and concrete are fed into a hydraulic compactor, which cuts out rectangular blocks that are finished with a steel mesh.

6. **Pre-cast adobe.** Although these blocks are more resistant to erosion than most types of adobe.



Workers strike the mortar joints—make them smooth—concrete by passing a trowel over them with a piece of 10-inch-diameter PVC tubing.

**Turquoise Adobe West** is a medium, 100-ton-per-hour operation owned by Jacobs and partner Peter about 14 miles northeast of Tucson. But it generates an impressive output, exceeding 1,000 cement-stabilized adobe blocks a day.

The process begins with a truck-trail mixers, which scrape the soil with discs to about five feet—the deeper soil is “not greenish,” says company president John Jacobs. The soil is dumped onto a vibrating screen that removes any stones larger than three-eighths of an inch. Next, the screened soil moves on a conveyor belt under a header nozzle, which sprays out a measured injection of portland cement. The cement-soil mixture then drops into a platen mounted on the front of a forklift, and the operator adds sand and straw. The recipe for adobe, by volume, is 60 percent screened soil, 7 percent wheat straw and 9 percent cement, combined with enough water (less than 10 gallons per 12 cubic feet of soil) to make it stiff but pliable. Each cemented load purples. The soil provides salts, the cement gives further reinforcement. And the straw, purchased from a local

farmer and chopped into four-inch segments, does several things: protecting the drying tiles like a more slowly cemented drive, the stronger it is, imports some binder strength, keeps the P-tiles a brittle and breaks up soil lumps in the mixing process.

The mixed soil—soil+straw+soil+water is a moist mix that has been dotted with a nearby soil for the more mineral you’d find a cactus pad—to keep the form from efflorescing. All articles are cast, one step at this point on metal plates. All articles are cast, one step at this point on metal plates. “The key to keeping costs down is to avoid moving the valve by hand,” Jacobs says. These bricks sell for \$8 or more.

The mix is dumped and kneaded to create 80 blocks at a time. Each standard brick needs measures 8 by 11 by 16 inches. In construction, these dimensions will fit the ear with mortar approximately 4 by 10 by 16 inches, which is compatible with a wide variety of windows and door openings. Just a few minutes after they do the packing, workers tilt off the forms and the blocks dry; they can be laid up in a wall within a week.



# the birth of a mud brick



Adobe bricks are made directly on pallets to avoid the labor of moving them by hand. **Step one:** A freshly mixed batch of soil, cement, straw and water is dumped into a metal form.



After mixing—dropping a metal bar across the top of the form to measure a consistent thickness—workers gently tilt off the form.



Bricks are in the dry desert air for at least 4 weeks. Then these pallets, each weighing 2,000 pounds, will be transported via truck and taken to construction sites.

See the story on page 11, for detailed sources.



## OUR FATHER'S HOUSE

At Mount Vernon, one encounters the real George Washington—soldier, statesman and handyman



Mount Vernon from the east lawn. The high colonned porch, often cited as one of George Washington's most innovative architectural touches, is an integral part of his vision. A sketch from his estate at George Washington's estate from 1784, is on display in his study.

MOUNT VERNON was more than George Washington's home; it was his project. From the time the Virginia property came into his hands in 1754, when he was a bold and desperately ambitious young major in the British army, until his death two weeks shy of the millennium in 1799, by which time he was the embodiment of American grandeur and rectitude, he never stopped tinkering with the place. For much of his life, Washington was away from home on thunderously urgent business, and so he directed most of the work on Mount Vernon from a certain Olympian remove. But his correspondence is so filled with appraising references to wallpaper, nails, paint, hinges, locks, putty and glass that the man who emerges from it seems as much a frustrated handyman as the presiding figure of his age.

Even when things were at their bleakest, when his new country was falling apart before his eyes, Washington never lost interest in his fixer-upper on the Potomac. In September 1776, in one of the first crucial engagements of the Revolutionary War, the Colonial army suffered a humiliating rout on Manhattan Island, fleeing in panic from the invading British and Hessian forces as Washington rode among his troops on horseback trying futilely to beat them back into action with his riding whip.

"If I were to wish the bitterest curse to an enemy on this side of the grave," he wrote to Lund Washington, the cousin who managed Mount Vernon in his absence, "I should put him in my stead with my feelings." But in the same letter, penned in a dark hour when his cause seemed hopeless and he felt his reputation sagging into disgrace, Washington was still issuing instructions for work on his dream house. "The chimney in the new room should be exactly in the middle of it," he instructed Lund, with

a whiplash change of tone and taper, "doors and everything else to be exactly unserviceable and uniform—or short I would have the whole executed in a masterly manner."

The heterogeneous Palladian mansion that Washington continually remodeled on his 5,000-acre estate sits on a high bluff above the Potomac. Although it is now just 11 miles downstream from D. C.'s National Airport, Washington's "Blame House" still manages to impart a formidable sense of importance and history. And if you're fortunate enough to have the place to yourself, as I did one recent evening thanks to the hospitality of the Mount Vernon staff, Washington seems to more succinctly possess than the fireflies on the sloping lawn or the swaying branches of the aged pecan tree that towers above the southward wing of the mansion.

I was wrong that night on the porch, the commanding high-angled ground-level porch that faces the river and runs from one end of the house to the other. It is a beguilingly columned and veranda space that George and Martha Washington often used as an open-air dining room. An extensive veranda like this—which has since become a mainstay of North American domestic architecture—might seem to be an obvious way of taking advantage of Mount Vernon's splendid location, but at the time the porch was built nothing of the sort had yet been seen in England or in the New World. The supremely practical George Washington simply thought it up on his own.

From the porch, I looked out over the lawn in the fading light. A gentle gray slope led down to a sharp precipice planted with trees, my eye caught over the leafy canopy of this "hanging wood," past the deer park below and on to the unimpassable Potomac. The only hint of the present century was the steady electric light of a single boat and the overhanging plumes of its engine.

When George Washington's father built his compact and unassuming house here in (it is believed) 1738, it had faced unashamedly east, toward the river and England. In the first of his two major remodeling projects, Washington raised the elevation from one and a half to two and a half stories and subtly

The main entrance to Mount Vernon, where Washington greeted visiting guests, different the west side of the mansion, it opens out on a grove of ancient oaks for the breeding grouse.



4 Rev. Fara.	
4 to be below	Arch.
to the Reapers,	
back walk,	
4 to the foot,	
4 together	
4 with sticks	
4 to the top	
4 above Rock,	69 120
4 to go	

In a letter,  
written May 24,  
1775, George  
Washington  
calculated the  
number of  
bricks needed  
for each section  
of a new fort.

## His House, **Our House**

It to be below  
to the Reapers,  
A brick wall,  
It to the foot,  
or together  
as with take  
It to the top  
A brick wall,  
It to the foot } 69 120

renovated the barrier, placing the formal entrance on the west and thus shielding the western Potowmack side from the constant bustle of arriving and departing traffic.

Washington made dooms of such major alterations, eventually turning his father's humble frontier home into an imposing, but never overwhelming mansion with multiple dining rooms and porches, eight fireplaces, a study and a cluster of outbuildings, known as dependencies, elegantly housed in the main house by calculated pragmatism.

He never claimed to be an architect—but once wrote that, although he knew “rules of Architecture” existed, he did not know what they were—but the structures and railroad spans of Isaac Stevens are architectural expressions of his mind and will. A few of his building sketches survive, and they are plain and clear and sometimes highly inventive. “Washington was an own architect and builder,” wrote his wife’s grandson, George Washington Park Curtis, “using half everything himself! The buildings, gardens and grounds all were to measure and usefulness under his framing hand.”

George Washington spent his whole adult life constructing Mount Vernon, and to a degree it is a summation of his own complex and ever-evolving personality. It is, for example, a monument to privacy and containment. On the outside, there is no display, no ostentation, no architectural flourish that does not serve a visible need or reflect a practical pleasure. Inside, however, in the dining room and parlor, one finds a host of the flotsam and jetsam, the unimportant and calorifically vain stuff that it was Washington's habit to save. The walls in these rooms are panelled with sunburst, chequered, calico—gleaming plaster that served the purpose of shadowing out windows—there are whiskers at the outer walls with

**His House,  
Our House** New York architect Robert A. M. Stern, who has designed dream houses as big as dreams, from Howard Stern, an

A white range of design elements derived from McMillan's original plan for the city, including the monumental scale of the buildings, the use of classical architectural details, and the emphasis on axial planning, were adopted for the new city. The design of the city was intended to reflect the values of the United States, particularly the principles of democracy, freedom, and equality. The city was designed to be a symbol of the nation's progress and prosperity, and to serve as a model for other cities around the world.

Women are more ubiquitous. Classified as male, Alice Greenway points to the predominantly American circular cities that make the trial of a self-accusant like the "hanging-bridged" queen of the frozen Washington built (through Vernon Ladd's) American culture. Circular theories seem to operate against themselves in quiet opposition to each other.

On those occasions you might find rounded nose-slings, which, like those of Miguel Vargas, are "painted to look like Portuguese," says John G. Wells, an enthusiastic historian. He frequently sees copies of the emperor's nose-guards in Indian and Chinese collections, and in the small dining room. The most striking feature, Wells claims, has been removed from Huntington's residence, the says, is the self-sufficient priest.

Although more than 200 years old, these rooms continue to be in use. The dining room, which was converted from the original two-story entrance hall, now contains the original paneled walls and a fireplace. At first, one believed that "Washington had built these bright colors," says Headrow. But both chimney and plaster graphic techniques agreed with 18th-century plasters. "After the restoration is complete, we'll know that Washington's two dining rooms were reintroduced in different shades of vermillion, green, blue, and, of course, white," says Headrow, who has requested the panel frames.

center. It is his duty to urge that these notes have come to us in response from Washington's supposed friends, but let us do our best to remind us that the great, true, leader who publicly disclosed pump and probe is now of turning away accidents also spent a good deal of effort designing his own uniforms and obviously placing his worldly advancement.

Still, it is the public *Washington*—even tempered, even-handed, magnanimous—who dominates Marvin Weston, just as he dominates history. During the eight years he was every fighting the revolution, he always never left the camp, crossing home only first a total of 10 days, but always an almost gaillardish consciousness to oversee the placing of every board and the hammering of every nail. “What are you going about next?” he wrote to Land in 1783. “Have you any project of private port and City? Are you going to repair the *Esplanade* of the *Place*? Is anything stirring, or like to be done with respect to the *Wall* at the edge of the Hill in front of the *Place*? *Port* made good the destroyed *Tunnels* at the ends of the *Hausse*, in the *Hedges*, *Port*. But if you made any attempts to reclaim

It was an endless, expensive, constantly expanding project, made possible only by the hundreds of slaves that Wuhegran



The capsule built in 1915, served as a natural air-circulating system by drawing hot air from the interior of the house. In 1927 Washington added a greenhouse, a store of pieces made of hammered copper. The capsule, which dates from the 18th century, which were imported from the Mediterranean as a fire-prevention measure.



MOUNTAIN LION HABITAT

Washington's modest 20-acre Mount Vernon was not on the east bank, looking out over Washington's "splendid view" toward the Potomac River.



and his wife owned. Most of these slaves were field hands, but some were skilled carpenters and housekeepers. Washington's consciousness was troubled, though not tortured, by slavery. He wished to end it altogether: "By these, more and insuperable dispositions," he wrote in his diary, "I have resolved all that other labor—all those skilled hands welding frames and barrels and carts and draw-irons—those whose numbers, to cut our opposite strengths, to erect his planter and fine his looks and to breed and increase the pure plantations, to cover the mansion, giving the appearance of an entire estate."

It was not just the mansion that was constantly being repaired and expanded but the whole plantation, with its stables, slaves' quarters, winehouses, kitchens, coach houses and laundry yards. There was even an innovative "dung repository" for compost. One of the plantation's most unique structures was a two-story nesting house. The 16-sided structure of this residence had approached a circle. Inside, a horse could walk around and around the circumference of the round room, flaring when with its knees. As the grain was separated from the chaff, it fell down to the collecting floor below through grates in the plastering. The barn fell into ruin and disappeared sometime near the end of the 18th century. But when I visited Mount Vernon, a massive and expensive replacement project was under way, requiring the gutting of 300 logs, the molding of 40,000 brackets and the applying by hand of 15,000 cypress shingles.

I spent an hour or so inspecting the framework of the old, tilted barn and watching workers level out new planks with driving knees. Then I went on a walking tour of the grounds, poking my head in all the outbuildings and meandering through the two remarkable gardens—one for growing fruits and vegetables, one for ornamental flowers—that flank the building given round from the west face of the mountain. It was an intoxicating contrast, set just the plants but the beautiful terrace leads well enclosing them. Even the sunken parterre, with their white doves and spouting manure houses, were part of Washington's handiwork; the finished beauty of structure and open space that ranged over the entire Mount Vernon grounds.

"I am now I believe dead at this time," Washington wrote after his marriage to Martha in 1759, "with an irreconcileable Convict for Life and hope to find some happiness in retirement than I ever experienced under a wide and bounding World."

Washington was still in his twenties when he purchased the plantation, but another the bounding world was his own bunting; war could infringe his living a quiet and inconsequential life in a country square. His years of peace at Mount Vernon were chronically interrupted by bouts of war and political turmoil and by the continual reading his reputation threatened. In the end, that reputation almost totally obscured him. "Washington," Abraham Lincoln once declared, "is the mightiest name on earth."

During Washington's later years, when he finally managed to retreat from public life, hundreds of people stopped in at Mount

Verizon annually to take advantage of his hospitality. He was a contented yet somewhat elusive host, putting his guests for meals but frequently slipping away to his bedroom and private study, or to take his rounds of the plantation.

"Even not only retired from public engagements," he wrote to Lafayette, "but I am resting within myself.... I will never again draw down the curtain of life, until I sleep with my Father."

George Washington slept with his fathers today in a brick tomb built on his specifications on a windswept slope between the mansion and the stables; in a room, it was Mount Vernon that killed him. With a thud already round, he had moved again, going out on a cold and dreary December day to pasture round, eager to mark some more for removal so that the view of the river from the pasture would be improved.

He went to bed in good spirits that night but woke in the early hours of the morning with a violent, ulceration of the throat that slowly sputtered off his breath.

"I find I am going," he said.

He was 67. The bedchamber he shared with Martha, in which he died, is one of the stops on the mansion tour. Visitors are not allowed in the room, but they can look in through the door just long enough to take in the spartan details: until it is time to give the next person in line a tour. When I was on the tour I lingered there as long as I politely could, admiring the rustic pane floor, the plain white walls just that Martha parlored to George's bedside, the spartan lamp shades. When I turned my eyes to the bed on which

Washington had died, I felt an unexpected spurt of emotion, as I often spending a day at Mount Vernon I had normally come to leave the figure who had once been there slowly suffocating.

"I die hard, but I am not afraid to go," Washington gaped toward the end of his long last day. It was a grim and pessimistic passage, though one would like to hope he took some comfort in the fact that he was dying in a room he himself had built, that he was passing into beauty within the shelter of his own creation.



Betty McMoore loved the way her house looked like a Greenwich mansion until the foundation started leaking, causing water.



Strained to avoid smashing the stones in route or slipping into the water and intense gas, underwater expert Dean McElroy measures an exercise room that fell in McMoore's house and digs a trough around the buildings.

IF SHE THREW HER HABITS, FANCY MARLEY OF GREENWICH, CONNECTICUT, can think back to a time when her basement made her happy. Her husband, Terry, set up a workshop and an exercise room down there. The two children all but disappeared into the playroom, which the previous owners—"nice people who owned it never looked," recalls Marley—had painted in white. But soon after moving in 10 years ago, the whole downtown basement, after a spring rain, slipped onto a cold, soggy carpet.

It was just a little water at first, but with each storm the tide rose steadily higher in the basement. The McLoys' own had an electric sump pump, which kept things relatively dry until last October, when a Nor'easter struck the coast. At ten inches, the waves were high, and the winds were powerful enough to snap a giant white oak on the family's front lawn. When the tree fell, it ripped apart power lines across the street, leaving the Marleys—and their sump pump—without power for five days. Downstairs, water hit the oven-floor rock. "Everything was floating," Marley says. "All the kids' toys were wiped out. The pool table—oh, of course—was shot. The exercise equipment, gone." Not to mention the damage and the water better. In all, the damage came to \$35,000. Worse, the Marleys' insurance agent told them none of it would be covered, because their basement, like most basements in this country, was not covered for floods. "I always wondered why people

# Water, Water,

Wet basement headaches can be cured, with a little common sense and a willingness to dig deep. **BY CURTIS RIST** **PHOTOGRAPHS BY BERND AUERS**

In order to drain all the water that might leak inside the house, the exterior perimeter drains are disconnected next to the foundation, leaving the interior pipes free to move. Workers backfill around a trench through a bedrock of ledge rock that couldn't be leveled with the excavator.





Instead of using foundation tie, a mason inserts the rebar with a masonry sawing as a layer of 60-mil-thick fibrous cement, either to sealing cement.

“It really freaked when it came to water in their basement,” Markley says. “Now I know.”

Among homeowners, few things can match the aggravation caused by a wet basement. And there's no comfort in company. According to the American Society of Home Inspectors, 60 percent of all houses in the nation have foundation leaks, and the number climbs to 90 percent for houses built with cinderblocks. What is it, though? **Water** According to the basement expert at the American Society of Home Inspectors, 60 percent of all houses in the nation have foundation leaks, and the number climbs to 90 percent for houses built with cinderblocks. What is it, though?

“Water and money, of trying to find the leaks and fix them,” Weller says. “A lot of times of the house,” says Tim MacLean, president of U.S. Basement Waterproofing, a business he runs in Pleasantville, New York, with his son Dean and Ron. “It shows up in one little spot, and before you know it, you've got a big problem.”

Even crawl spaces and poured slab foundations are susceptible to water damage. If drained improperly, they can trap moisture and lead to mold. Hidden from view, the problem is easy to ignore until it's too late. John Antonucci, a licensed home inspector in Westchester County, near New York City, did a crawl space wet crawl space recently only to discover that “you could grab the beams with your hand and squeeze them like a sponge because they had deteriorated.”

As frustrating as basement and crawl space leaks are, many can be fixed with moist effort. “In a lot of cases, the problem starts because the site isn't right,” says The Old House Doctor company's Nancy Abram. This condition can be corrected, he says, “by helping the natural drainage away from the foundation.” As a fix, The Old House Doctor's Tom Slein suggests putting a boll on the ground next to the foundation. If it sits away from the house, the slope is fine. “If it rolls toward the foundation, you're in trouble,” he says. To fix the problem, Tom suggests clearing away foliage and gently building up the soil to slope away from the foundation, with a grade of at least one inch per four feet (to prevent water runoff) and, however, the soil should be kept at least eight inches away from wood siding.

Downspouts can also be a source of trouble. Some red right at the foundation, where, during rain storms, pools of runoff water can seep through cracks in the walls. Simply rerouting the water by extending the downspout a few feet away from the house can help. For bigger problems, the downspout can be emplaced in a pipe located 18 inches deep that uses gravity to drain water farther away from the foundation.

But not every problem has such an easy fix. At various times of the year, the steel water table can force itself into basements through a phenomenon known as hydrostatic pressure, which nothing can stop. “I've seen it

The foundation creating makes the walls stronger, more waterproof, the new efficient a 20-mil-thick plastic rubberized sheet that stops water from entering the structure.



After a corrugated block drainage is laid in the trench, gravel is spread on top to keep the pipe from plugging up with dirt. On the walls, sheets of fibrous base coat are glued onto the rubberized sheet to prevent leaking.

When repairing is not the answer, MacLean suggests building either an interior or an exterior perimeter drain to stop leakage. MacLean chose the exterior option, because the dad's want to rip up the carpet and floors in his flooded basement. “I wanted the unit outside,” he says. First, work crews excavated around the front of the house down to the foundation. They laid a drainage pipe in gravel to draw water away in a deep manifled trench dug 18-inches into the yard. As a protection, the foundation walls were waterproofed not just with a 60-mil coating of tar, but with a 20-mil rubberized sheet and an inch of foam insulation as well. “It's a lot of material,” MacLean says, “but there's no other way to make sure it works.” Finished in three days, the new drains and the waterproofing cost MacLean \$1,950, but the expense seemed worthwhile when the next storm arrived. “It rained last night, and guess what—no water!” she says with delight. “It was down about eight inches to check.”

MacLean may now be first at her session, but her friend Polley Markley still finds herself ahead. In the media since the Hurricane, she has had some good news.

The insurance company finally cleared her basement damage “in six of God!” and even paid everything. But to prevent another flood, the Markleys must build an exterior perimeter drain around their entire house. The exterior one, which will cost her \$21,000. Not surprisingly, Markley hardly finds herself yearning for a basement-free life. “I want to do the Honey David Thomas thing,” she says. “Give me some wood, and give me a cabin. If humans can survive in the simplest of environments, as long as it's warm.” And dry.



Both the heating duct and the dimensional duct are fed by gravity into pipes buried in a trench dug off to the side of the house.

## Inside Job

During a nor'easter at their new house in Brewster, New York, David Angley and his family found their downstairs rec room filling with water. "There was nothing we could do but stack up the furniture, roll up the carpets and start pumping it out," he says. An inspection revealed the problem: The house's exterior footing drains had been damaged during construction. They could be replaced, but a cheaper solution lay indoors: running a drainpipe along the basement wall. For \$4,000, a crew jackhammered a trench into the basement floor, top left, then dug it out so four-inch corrugated piping with sills on all sides would lie



below the concrete slab, middle. Interior systems require a gravity feed or a sump pump, which is installed in a shallow well, bottom left. Once the pipe is placed in the trench and covered with gravel, below, a plastic vapor barrier, bottom right, is laid on top and then patched with cement. "We've had lots of rain since," Angley says, "but it's been dry as a bone."

## Tom Silva's Quick Fix

**Repairing leaky pipes** In his many years as host of *This Old House*, Tom Silva has learned a few things. But for the areas you can actually see—other than drywall—drilling in through a crack in the foundation wall, like Tom does here, is the best way to fix it. Tom says, "You'll need a power drill, a masonry core bit, some thin-set in the cracks and then take 10 minutes like the broken walling contractor I'm using to push the cement in with a small trowel, then smooth it out. You'll stop water running in through a crack in a matter of minutes." He says, "The key is in the preparation: drilling. If you don't do that, you'll be wasting your money."

## Avoiding a Ripoff

**Waterproofing a basement in 10 days** And finding a reputable contractor for a big job can be even trickier. To figure out the 100-foot cost, says Tom, first, check with local installing companies, real-estate agents and the American Society of Home Inspectors, and ask the following questions of friends and neighbors who have had work done:

- Does your basement still leak?
- Does a contractor fix the one water problem, only to create another?
- Is the work guaranteed? You should get a 10-year transpiration guarantee against leaks.
- Who will do the work? If you're not sure, it's a good idea to get a second opinion.
- Who will do the work? If you're not sure, it's a good idea to get a second opinion.

an  
ameri  
craftsman

**bobdix**

*A master locksmith time-travels through a looking glass to solve historical mysteries.*

卷之三十一 田氏代齊(始子於齊)

Late at night, as ever, Bob Dix is here, leaning over his workbench in a small room in a corner of his basement. A white cloth, draped over the bench, is the soft bed for a palm-size, battered, filthy and lifeless padlock built by him during the Civil War. Dix is a bear of a man with a strong, resounding voice and manner, but he handles his artifact with the delicacy of a jeweler. He leans to his work, Mozart's K. 424 Duo in B-Flat for violin and viola floating lightly in the air, an otoscope his father the doctor used 50 years ago held to his right eye, the lock lifted to within inches. The lock is four and a half inches long, three inches wide, half an inch deep and weighs eight ounces. Its shape



One of the many aberrations to Gilt's basement museum feature tools manufactured between 1800 and 1840 by Fritts, a company originally located in Lancaster, Pennsylvania.

PHOTOGRAPHS BY RAYMOND WILSON

Eight locks from Dux's collection cover 800 years of history. Clockwise from top: a 19th-century padlock; a 17th-century lock, probably German; a 10th-century lock, made from horn; and a 19th-century Indian Apparatus. At far left: The early history of the generalization of modern padlocks—controlled by four locks dating from the 1850s to about 1910. At top left: In the U.S., this lock and its relatives may be the first padlocks ever built.



is reminiscent of a Valentine's Day heart—only for the less romantic, a tool that has taken off a big man's hand. It has the coarse touch of newspaper. But through the looking glass, the stereoscopic expertise of this concealed brass lock becomes for Dux a panacea of historical imagination.

"But this is classic for cleavage. It was hanging on a door and the holding-angle lock, something fell on it, and the key broke off and the case got wrinkled or the pressure and the heat, I think that's the whole scenario. Thank God it didn't work. Maybe it was in the Civil War. Maybe it was buried and dug out later. Heaven only knows."

The lock is returned to its box, the stopwatch laid aside. The 31-year-old man, who is one of the finest locksmiths in the United States, straightens at his chair, pinches his lips and raises his brows, taking a moment to answer what he is about to do. "This lock hasn't been opened or tested a hundred and fifty years. It's like opening an Egyptian tomb." One of Dux's friends bought the lock—unworkable and with its key broken off—in a New Orleans antique shop. Stamped on the shackle was "S. Andrews," revealing it had been built in the Firth Amboy, New Jersey, locksmith shop of Solomon Andrews. The friend paid \$40. When Dux is done, some collector will likely buy that man-of-a-hand relic for \$4,200—36 times its cost.

Dux reaches for a massive drill, but no, 67, minutes in above the fire of max Vennish with jaws that secure the lock's case, then flagon and release the trigger and lower the drill, having at last and the user's hand only on the down side of the motor's whining rim. If the bit were to



At right: A heavy-duty keyless lock. From above: GMRS are a digital key machine patented in 1991. This shop is fitted with GM equipment that is far more powerful than mature models.

Among the rarities in Bob's basement are several anti-slavery locks made by 19th-century American manufacturers long out of business.



rip off the rounded cover with the drill under power, it would snap a few of brass from the case, which would leave a jagged, snarled lock with, smaller transfers in the shape of laurel leaves, might suddenly powder or the very last. One problem just how this padlock case can be damaged in a fire. He surmises his arms to be an orchestra conductor and moves to walk that out the backshop for a ceremonial art gallery of locks, some gleaming bright brass and steel, others hanging off and aside, locks 2,000 years old, locks still in the factory wrap.

"Everything here is a story."

Seven thousand stories are stored in Doc's Monroe, Ohio, basement, which houses probably the world's largest collection of locks. Each reveals a slice of history. A lock from the Dark Ages is made in the acanthus, or leaf, style of the era. A trac lock, beautifully etched, shows the emerging artistry of the Renaissance. The simple mechanisms of antique European locks contrast with the ornate, clockmaker styles of 19th-century American locksmiths. The 1,100 "logo locks" include the trade names of business giants long dead in shadow names: Hudson Motor Car Co., Cudahy's Cleveland Trust, Belle Isle Cemetery. And the pride of the collection is the signed O. L. Fecoy lock (Doc believes it was the first pin tumbler ever made) and the precursor to the revolutionary line of locks launched in the 19th century by Linus Yale Jr. The pin tumbler allowed infinite master keying and made possible the billions of locks that today secure houses, cars, hotel rooms and offices.

"Locks are talking to you," Doc says, in his gags his drill again and at whizzes, digging into another ruse. "They are living pieces of history." When the drill stops, he sweeps over the brass shell with his fingers and examines his work through the microscope. "Okay, that's one good."

Selmon Andrews was a New Jersey dentist who also made locks. Doc has smaller Andrews locks, strong steel locks, good locks. This brass lock was cheap, made for an emerging mass market. Doc knows that the men who made this pin lock would think him crazy for spending 30 hours restoring it. But to Doc, it's like a rounded shell unbroken from a rounded culture. He'll restore it, as he has thousands of others, not for the money but as a well-run cottage. He shaves the lock and it costs cost.

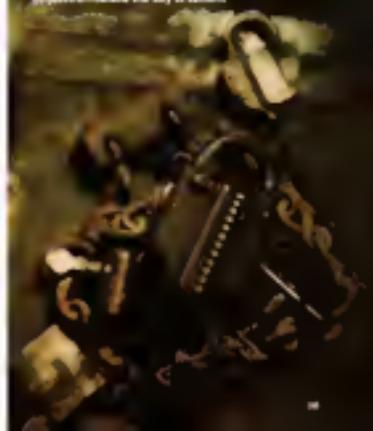
"What's coming out is making me nervous. I don't know how much mechanism is left. The important thing is the lever. Do I have to make the lever? I will if they lose too much strength in the fire. I'm really anxious to see what's inside. I have never heard of anyone finding an original Selmon Andrews key."

Bob Dier was 8 when his grandfather bought him his first lock, an inexpensive Shaysmaster. Doc took it apart and put it back together. He was always taking things apart—radios, TVs, telephones, the family clock. By the time he was 12, he'd go shopping with his mother in downtown Cleveland, and she'd drop him off at the locksmith shop at "old man Sackman's," who'd let young Dier work on simple locks. He began collecting locks. After college, he took a job with Lubrent Corp., the giant petroleum additive company near Cleveland. He has worked there 39 years and today is in charge of managing the company's recycling labs. For all these years, night after night, he has gone



A tiny lock, which required several hours to restore, may be the earliest signed American lock. It was made in 1818 by Pennsylvania gunsmith John Ketter.

Another 19th-century lock, made from sheet, brass, plates and wire mesh, is mounted in a brass ring—another that the key is hidden.





The Bullezeau is another Dux's reflection of 19th-century American pocket watches. The case is extruded up to the square result in the shoulder.

down to his basement cavern and unfolded his white cloth.

"Hans, which river is holding it?" he says, as he lightly squeezes the handle of the rescue-pressure pliers he has gripped inside the edge of the Andrews lock, where the doublets are entwined, holding as taut as taut from its back. He has drilled his tiny holes in the corners that hold the front and the back of the case together, because he wants to twist no many rivets as he can. If they are steady enough, he'll have snared a tiny screw to the top of each one. The screw-snaps will snap off with pressure but leave a protruding top atop the rivet that he will then round off to perfectly match the surface top of the original rivets.

After drilling his holes, Doc files off the rivets' rounded tops, leaving only a half-inch lip to hold them at place. Then, with a tiny jeweler's screwdriver, he cracks off the lips, leaving nothing but tension to hold the case together. "Lath put a nice, even force," he gently squeezes his pliers—pop! "Not twice the God Who," he whispers, and bins off the tail of the rivets. "Oh, my goodness. That's the mechanism."

He does a quick inventory. Four, maybe five of the case rivets are ruined beyond redemption. The lock was definitely in a fire, as back distorted from melting. But it won't burst, no sir. The majority of the lock's broken keys are brass, meaning it could be the original key, the first Solomon Andrews key he has ever discovered. Strange, but the leading edge of the key was cut at a 30-degree angle, something Doc has never seen. The lock's weaks are ingeniously angled four-weldless sprung pins served as both lever and hole, supplying pressure to open the lock and pressure to close it. But Doc can't put tall how it worked.

"I have to re-hire and figure it out."

Now has Doc mounted a lock he hasn't figured out. He can put his lock-picking tools in a kophatic, and in a moment of merriment the lock is open. After 43 years of working with tools, he actually visualizes how the mechanism must be held to fit into a certain size slot. He can feel the toolbox's language through his fingertips. He once opened a pair of Headless handcuffs in 38 minutes. He once rebuilt a famous 188-year-old F. Hart track lock that had lost its entire handle. He would fit this mystery lock—a puzzle frame without pattern—for three years. One day, at a flail, he saw the only combination of space and mechanism that would fit. The collector for whom Doc was refurbishing the lock refused to take it back, so saved was he by the achievement. "It's your lock now," he said.

Doc doesn't just sit down and do these things. He'll carry a lock as his pocket for days or weeks, ride it out and tap it on his hand while studying a computer program at work or watching the History Channel at home. He doesn't think about opening the lock. He has what he calls his subconscious until he answers. "It's like it comes in a working dream." He once left an antique Pyes lock, a lock nearly impossible to pick, on top of his washstand for six months. Then, as he was watching a movie with his wife, he had an urge to go look at the lock. He walked downstairs, opened it in 10 seconds and was stunned to the minute.

"I hadn't been able to open it before, and I bet I couldn't open it now. It was very strange." He laughs uncomfortably. "The Zeta, as you will. It's like, well, you're at another place with this lock, which sounds crazy to say somebody at a barbershop and compare it to say, 'But I see it. There

are times I fit a key, and I know where to make the cuts in that lock, and if I can't explain how I know it's going to change from experience and practice. But at an angle, I lost track of time. My wife gets mad at me. It can be two or three in the morning, I didn't even know it."

"Unless you appreciate it, it's hard to describe. If you try to talk to somebody who doesn't understand, they think you're nuts. You don't talk about the state of mind you need to be in to do that work. It's the same state of mind Doc believes the first people at top field must also seek. The greatest invention isn't only technically proficient. Doc knows, but also reaches an intuitive place with this music. So too great artists, actors, writers, actors, scientists. Everyone knows the same state of mind physicians, but he believed at the parallel's noisy frame and saw the only way the pieces of time, space and emotion could fit. 'It's a mad-out,' Doc says. Clocksmiths—supposedly simple, practical, hand-on people—are thought to be outside that intuitive realm, but Doc knows they are not. "It's spooky stuff, but that's been a goal."

Jean-Marc Ladurie-Sauret, Ulys 3, Ne 4 to F is floating lightly in the air. Doc has for hours now sealed the piston of the Andrews lock in an ultrasonic bath that causes millions of tiny exploding bubbles that clean the oxidation. He has polished the case and cracked to a burnished antique brass, giving the titanium tail of a wooden oak plank. With tweezers, he has carefully converted the lever holes, all but share of the river and the broken



In Dux's opinion the clock-like precision of this multi-dial lock, dating back about 1845, makes it perhaps the finest example of American craftsmanship. In a single lock

mechanism that would have kept in time opening with a standard key. Doc suggests Andrews signs off. "What are we gonna do?" For the locksmith whose invention flushed on the original car, Doc has great respect. But he suspects this faulty lock design was quickly abandoned.

Doc has yet to put the people's pocket back in their frames. He takes his tools to the river now, so his tools, cut a new key from the original surface and chemically treat the lock to create a deep brown patina that will evoke an elegantly aged character respectful of its antiquity. Then Bob Dux will perform one final act before he closes the case for good. He will rich his tone inside the lock of Solomon Andrews and become for ever a piece of its story.



A century and a half worth of grit and corrosion was removed from the Bullezeau Andrews lock.

## TIPS FROM THE LOCK DOG

- Don't bother spending a lot on high-endurance basic locks for your home, Dux advises, because most intruders aren't going to pick your lock anyway. They're going to kick in your door. "Put your money in the door lock," he says. The dead bolt should extend like a standard residential mortise—the strike—held in place with at least four lock-shaft screws. Also, the usually short screws that hold the catch-lock assembly to the door should be replaced with two-inch steel screws. If you have a door with glass in it, consider a double dead-bolt cylinder that is turned from the inside with a key that can be removed when you leave the house.
- For added home security, Dux suggests inexpensive, automatic, motion-detection flood lights at critical areas around your house.
- For a general idea, he recommends any standard pin-tumbler padlock. These kinds of locks are most likely to quickly unlock.
- For bicycle security, Dux says, use a large U-shaped shoulder lock and be sure to secure the frame and the wheel together to a stationary object. The male links in the chain tuck down. "These people don't want to be smashing them," he says.

# the menace of **mold** and **mildew**

Confronting a  
biological hazard  
that can be harmful to  
your house and  
your health

**TO TROUBLE WITH DECAY AND DRAINED BY PERSISTENT MIGRAINE**  
headaches, Delon Bowman felt her life falling apart after she moved into a new house on a placed out of use at Seminole, Florida, 12 years ago. At 23, she had to ask her mother for assistance with grocery shopping. "I couldn't walk straight down the aisle. I'd go from side to side. I remembered being at a tennis function and being so dizzy I thought I would fall down. I had to hold onto the table." Her son's own mom called for help over a year.  
Bowman tried for poison used in way to the think. She went to one doctor, then another. "It took antibiotics, decongestants, steroids, nasal spray, decongestants, cough medicines. And when it was really bad, they'd even give me steroid shots in the office."

Told she was suffering from an allergic reaction, Bowman assumed her lifelong hay fever had taken a drastic turn for the worse. So she stopped smoking as much as possible, kept the windows shut and bought expensive filters recommended by an air-conditioning manufacturer. Nothing helped. Then, two years ago, during a two-week vacation to New England, Bowman felt wonderful—no headaches, no aching, no nasal trouble. She decided returning to Florida. What car trouble forced her to stop for a while 20 miles from home, she was surprised that she still felt great. The next day she walked through her own front door, and within half an hour her headaches and aches were back.

Finally Bowman realized the problem wasn't Florida, it was the house. An indoor-air-quality technician solved the mystery when he popped open an air-conditioning unit and revealed mold so thick it looked like carpeting. When he returned, the technician left sick too.

When three workers came to vacuum the debris and hose down the air handles, Bowman's brother, Ray, was assured that they were taking measures, as if they were working on a nuclear reactor. "Suddenly you go, 'Holy Toledo, we're breathing in this!'"

Like most people, the Bowmans thought of mold as blue spots on bread or black stains on the great around the bathtub—a minor household occa-

BY SUSAN RENESCH  
PHOTOGRAPHS BY  
JOHN KERRICK



Like a neighborhood running in '68, the mold here in a closet and bathroom of this 1940 bungalow in Atlanta, North Gwinnett, shows which can happen when maintenance problems are ignored. While the house was foreclosed for \$14,000, the cost of repair is high. The new homeowners had the looks, but they struggled to eradicate the mold.



**Mold from the North Carolina firehouse** (collected on previous page) reveal some of their secrets under a microscope. After the roof of the house was replaced, the moldy walls disappeared. But when an air-quality expert went in at the *Charlotte Observer's* request, he found the air was still loaded with live mold spores—up to 20 times more than is considered safe. In another room, where insulation had covered it, he found the walls were white. Moldy spores are, after all, like spores on paper, right, that passed from the dried-out ceiling.

## voracious fungi

Mold and mildew are interchangeable names for thousands of species of filamentous fungi. Clusters of spores parched on the ends of dry stalks may be brown, black, green, blue, pink or white. Some look fuzzy, others slimy. The spores are the fruit of a moisture-and-nitrogen-rich life cycle. In mushrooms, nutrients are present throughout much of the stem, which extends into the ground; in mold, spores are released into the air.

Both the moldy and spore may contain compounds that make predators think they are the biggest threat to their existence. They may be more likely to be harmed. They are only 1 to 20 micrometers long (1 micrometer would fit on the head of a pin), and they eat easily and invisibly to us.

Molds grow at temperatures between 20 and 90 degrees Fahrenheit, but many species do best in the 70s and 80s, the most common residential temperatures. They require either water or a relative humidity above 90 percent. Most dead organic materials can supply food—mold is one of nature's primary recycling agents. Even the oil in a disintegrating oil lamp will do. Molds can digest the cellulose in paper but not the cellulose in wood. Thus, although they grow on and disintegrate paint and varnished surfaces, they do not eat wood.

As a byproduct of digestion, molds release volatile organic compounds such as ethylbenzene, xylene and ketones. These give molds their musty odor, a moldy soap growing, dried-out soap and dried-out bread. But the mold is only dormant, ready to resume feeding when conditions are suitable.



The mold-infested firehouse in Kinston, North Carolina, was a 5,200-square-foot working present to Gary Tirkundi from her new husband, Mark Strickland. "It's the most beautiful," she says, smiling, "but since the committee" Tirkundi used to chair for the cleanup because mold did not penetrate the hard surface of the plaster walls. With drywall, however, something else needs to be done if mold has permeated the outer layer of paper.

since no more dangerous than asbestos. Yet, any of the parasitic fungi commonly known as mold can be a serious health hazard. As they feed on paper and other common materials in homes, molds produce compounds that may cause serious allergic reactions in 15 percent of the population. Some molds also produce potent carcinogens that can make people sick.

"Mold contamination is of far greater consequence than is generally recognized," says Jeffrey C. May, a home inspector in Massachusetts who estimates that one in every 10 houses he has examined in the past several years was moldy enough to make its occupants sick. "In fact, mold could be the source of indoor pollutants with the most widespread impact on health."

In serious cases, mold might even be deadly. In the early 1980s, all four family members had to leave a suburban Chicago house reported the like symptoms, skin rash and fatigue. Doctors were baffled until the family discovered mold on each chalk in the floor and on a ceiling under a roof leak. When chemists analyzed samples from those molds, including one called *Stachybotrys* (above, right, five red and five green), the woman died within 28 hours. The family's symptoms improved after the house was cleaned of mold, says Bruce Jarvis, a University of Maryland chemistry professor who worked on the case.

Three years ago, patients in Cleveland were scared when several developed a rare form of bleeding in the lungs. Since then, 25 babies in the city have been diagnosed with the same syndrome and nine have died. Nearly all lived in old, poorly maintained houses with water damage from roof leaks or flooded basements and, as a result, large amounts of *Stachybotrys* mold. Gary DeBoura, a pediatric pathologist who treated most of the babies, says mold is the most likely cause of the deaths. Nevertheless, some mold specialists maintain that a lethal dose of spores would be enormous, more than anyone is likely to inhale in a home. But even the most skeptical among them say there is a clear correlation between dampness and mold in houses and respiratory disease.

Many people assume modern houses are protected against mold, but often it's just the opposite. Until the 1970s, insulation and the subsequent emphasis on energy-efficient construction, many houses were so drafty that moisture generated

made could escape. "When the building was leaking but platen, you could boil spaghetti all day long, you could take a shower all day long," says Richard Trifunovic, The Old House's expert on indoor air quality. "But the modern houses—the houses built from 1975 on—are tight thermally. What ever humidity we create can't escape. That's why the mold problem has to come."

In the hot, humid Southeast, homes used to have ceiling fans, windows that could be opened to let humidity and heat out. Shutsers to facilitate moving air, which can mitigate the moisture on which mold depends. Nineteenth-century housekeepers took down laundry that might become moldy in the soggy summer months, as Mary Toliver of Stevens, Georgia, described in a friend's e-mail on May 18, 1997: "Summer has hit us with a vengeance and we are beginning to suffer and sweat."

Today, many homeowners mistakenly think they are protected by the dehumidifying power of air conditioning and central heating. But these systems can actually increase mold because cold air can hold much moisture as warm air. Condensation can form where warm air touches a cold surface, such as on the underside of an uncoated fiber board. "It's pure like the inside of a Coke can," says Robin Scarry, a microbiologist at Pure Air Control Services, a Florida indoor-air-quality company.

Once tests are ruled out, consider airborne moisture. In fact, humid climates, outside air is the primary issue. If an air conditioner is used during the day, moisture should be added at night even if the basement is perfectly sealed. "It's like adding water to a dry sponge," says Scarry. "It's like adding water to the sponge from within the sponge. You sponge out, much as condensation forms on pots and pans and reporting condensation on solid water days do—unless moisture between bathroom doors can dry. In the bathroom, leave the door open after a shower and take towels elsewhere to dry. Basement fans can also help, especially in bathrooms and in the kitchen. Make sure they vent to the outside, not into the walls. The last-ditch line of defense is an air-to-air heat exchanger, a device that allows outside air entering through one pipe to preheat, heat air moving in through a neighboring pipe. A whole-house model costs \$800 to \$2,000.

In some cases, it may pay to buy a portable dehumidifier. Model cost for less than \$200. The water reservoir should be emptied regularly or mold and bacteria may grow in the tank. A \$40 hygrometer, a device that measures relative humidity, can help determine how to treat the problem. If the relative humidity is above 60 percent, if a hygrometer indicates the relative humidity to above 80 percent, by reducing the humidity on the air conditioner a few degrees to decrease the relative humidity.



**Her vitality restored,**  
Debra Brown  
seeks evidence of  
the mold that once  
grew in her home's  
air ducts.



## counterattack

For mold on a

resilient

surface, such as

old-fashioned plastic, the cleanup is relatively simple. First, set up a fan so it blows fresh air toward you. (It would require more than 10 square feet, says off-the-shelf

fan in a 10x10-foot room.)

Then, use a mask to

protect your lungs.

Wear gloves and a high-

efficiency particulate air-

filter (HEPA) respirator equipped with a respirator cartridge. Using a bleach

solution—use one

ounce of bleach

per quart of water—

scrub moldy spots

for at least five seconds. Rinse the

surface well and damp the walls

under the shower head.

Then use a HEPA vacuum, which

can be rented, throughout the

affected area. (An ordinary

vacuum will stir up lingering

spores that won't release their

toxicity.) Finally, turn on the

central heat. Keep the

rest of the house clean by

passing contaminated

material to double bags

and filling them out through

windows if possible.

If heating or air-

conditioning ducts are

dirty, make sure the

contractor you call is

certified by the National Air

Duct Cleaners Association.

Don't ignore typically use

compressed air, HEPA

vacuums and brushes or

duct tape. Fiberglass-lined

ducts are easily damaged by sharp

brushes and very high-pressure

compressed air. They should be

thoroughly vacuumed with a HEPA

vacuum, advises Steven Green, a

duct-cleaning company in

Cambridge, Massachusetts. If

it's not sufficient, the ductwork

may have to be replaced.



A professional  
mold-cleaning  
service uses  
a HEPA  
vacuum to  
remove mold  
spores from  
the air. The  
vacuum is  
connected  
to a HEPA  
filter to  
capture  
the mold  
spores.



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**The House**  
on PBS

the  
Poster

# MOLDINGS

First a board takes shape, then the room

Without moldings, a room is raw. They hide the rough joints between floor and walls and around doors and windows, covering up the often erratic margins of different materials. Their profiles—wide combinations of shapes, thick and curves—make eye-catching bands of light and shadow that add texture, depth and warmth.

There are thousands of profiles, yet all are made from the same way: smooth square-edged blocks are cut into a powerful molding that whittles them down to less than 2,000 grams, and cut corners back after that a step profile 20 to 30 centimeters at a time. For such a straightforward process, the results can resemble fine art: other materials, machine-made that is, can't match them.

Good are the plain moldings that fit the room's interior corners and doorway heads. Manufactured in large quantities, they have relatively static dimensions and limited profiles. But there are the moldings that meet specific needs, and they do the job—covering cracks and making doors—often with limited options.

Good hardwood moldings are a step up from pine. Also particu-

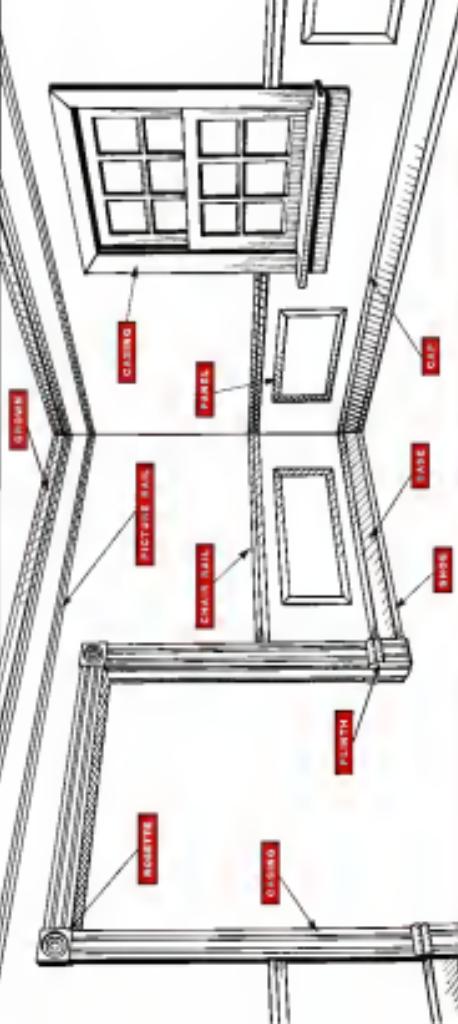
larly popular are moldings made from oak, they offer bigger dimensions and bigger profiles than run-of-the-mill pine.

The best moldings are made of wood that is thicker and wider, with profiles more pronounced and complex. They come from local mills and small-scale suppliers, both of which may have lines for hundreds of profiles. Some will grow new little trees for special profiles.

Most large-grade moldings are made of poplar, a harvested tree that doesn't clearly stand out as a strong protagonist. Poplar, the pine, is avoided unless the clear finishes, oils and varnishes are absolutely available, and on request a mill will usually very often offer them.

When fit is installed, any grade of molding needs about a week, spread out. Rest on this floor, to acclimate to its new home. This will help to ensure that joints and beams stay tight. Joints should overlap glass, and in prevent popping like bubble should be caulked with paint or varnish. The floor should always be sanded before painting and between coats. But do it lightly so these interpretation don't get dul-

**A MOLDING PRIMER** If you're new to angles, a *Book of Moldings* should be the place to begin. But there would only be 4. Use directions. The basic types of moldings shown here are generally named for where they go or what they do. Master a couple of dozen—more words—right and you'll be off to the races.



For the 10th year in a row, the 2012 **2012 INC. 500** ranked by revenue growth, is the most comprehensive list of the nation's fastest-growing private companies. The list is based on annual revenue growth from 2008 to 2011. **2012 INC. 500** is the result of a joint effort by Inc. and Deloitte. For more information, visit [www.inc.com](http://www.inc.com).



# MOLDINGS

PHOTOGRAPH BY DAVID M. MCGEE



**ROSETTE**

**THE PIECES IN THIS COLLECTION**, a small sample of the tremendous variety of moldings, represent a month's worth of top problems. Yet simple solutions do not account for all the possibilities. In creative molding a can be conform to problems all more elegantly. Moldings can also be classified. Then considered often no problem is unique, containing part this part of some profile they need. When placing an order, the first cut off the supplier offers only standard lengths or if a will cut—only change for the lengths you want. The best molding is expensive, but it's better to have some left over than to come up short. A small, thin sliver left over can be used to replace a snap here and there, and the last sliver might not perfectly match the first snapshot!

**CROWN** moldings are usually block or square, from the wall with the deepest and most complex profile running along the lower edges, which creates shelves and a series of depth. For a bolder look, crown can be finished on the wall and ending with flat planes of wood that create additional recesses of light and shadow. **PICTURE NAILS** have a thick, rounded top edge for holding a small hook. This permits hanging and suspending pictures without making holes in the wall. **CHAIR PAILS** have a pronounced concave element, designed for hanging chair backs many years ago. The ribbed along the back of **PANES** including a decorative band. The top piece can be reinforced with other moldings, such as a light and decorative balustrade. **PIVOTED MOLDING** is popularly known as batten. A batten is a series of door opening and thicker toward the opposite side. Victorian styles are often geometrical and there's a flick at both ends. **ROSETTES** are a Victorian invention meant to spread caring immediately by eliminating major joints. A well-joined rosette would have the same appearance as the others, but would be made with a circular center instead of a straight one. **PILASTERS** are used, symmetrical moldings that are used with **PIVOTED MOLDING** to simulate a column. **BASEBOARD** are always thinner and thicker near the floor and get thicker as they rise up the wall. The **BASE** **CAP** makes the transition from floor to wall. It can be designed on the underside, or it can be a decorative piece, the better to blend with items in the wall. The **BASE SHOE** does the same work at the floor, making a tight wear over spurs and doors.



**WINDOW AND DOOR CASING**



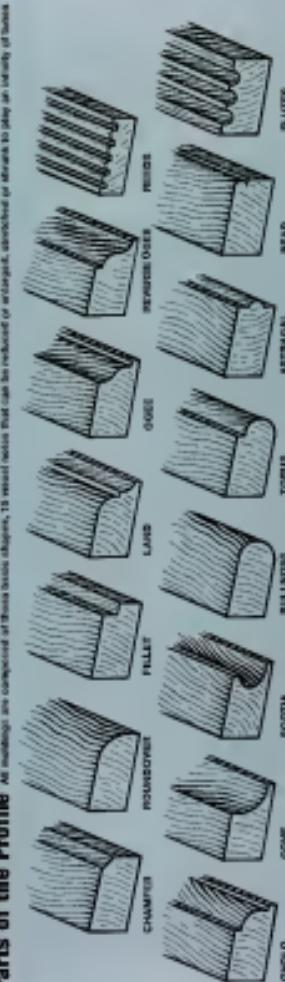
**CHAIN BASE**



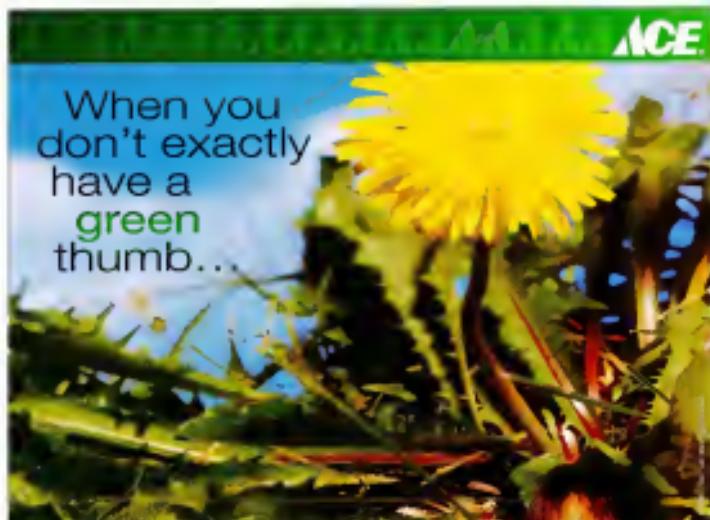
**PILASTER**



**BASEBOARD**



**Parts of the Profile** All moldings are composed of fifteen basic shapes. 15 visual notes that can be reduced or enlarged, stretched or shrunk to fit any variety of tastes.



When you  
don't exactly  
have a  
green  
thumb...

see the  
folks in the  
**red vest.**

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The Old  
**House**

in the garden

**Hothouse with History**

Restoring an elegant cast-iron and glass shelter for plants

BY SUSAN BENACK PHOTOGRAPH BY MICHAEL McLAUGHLIN

Working from a binder that lists what will be a 14-foot-long exercise path, Mark Ward looks a road rather to the new wing of the house. Cypress parties planned construction before the road will impinge the site. When she originally was first built in the 1930s, the plan was for a masonry wall about 20 inches high. At this greenhouse's new site, about 12 feet is cut before ground level, allowing access from both the living room and the basement. Paths will grow mostly at the far end, by the front door.



WATER OR OFFICE WORK, job-seeking expert Susan Shaw set out 15 years ago to design her own new career as a painter and greenhouse artist. She put her plan into action in a way that gardeners who buy plans before they propose the job can appreciate. The first thing she did was shop for a greenhouse. When a landscaper responded to her ad and offered a decommissioned one for \$1,100, she was astounded. She contacted Mark Ward, who has been designing and building greenhouses, sunrooms and skylights, largely from recycled material, for two decades. She told him the parts were made by Lord & Burnham, a New York firm that began manufacturing greenhouses during the Civil War.

Ward reveres the company's work. "There's an elegance," he says, struggling to explain what is best understood by looking at the curving spandrel of one of the wheels that opens the greenhouse's side vents. "There are all these wonderful cypress lats and cypress masts and bushels. On one level, it's sort of the difference between wood-frame houses and fiberglass houses. They both do the job, but to some people—so many people—it's more aesthetically pleasing."

Shaw bought the greenhouse parts and carried them home. She sorted the heap of parts into a thousand pieces again while she bought land in Weymaw, Rhode Island. While the plan named it a pole behind a parking shed, she worked at a garden center, managed several commercial greenhouses of the same 1930s vintage as her own, designed and built a small house on the property and got married. Finally, in March 1994, Shaw and her husband, John Sciacqua, began preparing to expand their house. With Ward's help, they planned to cover the greenhouse on a lean-to connected to a new wing.

So one day last fall Ward found himself screwing at an old cup-shaped block of cypress. He recognized it as part of a gasket. But to find one which parts, he would have to keep tearing at it. Although he had salvaged many old Lord & Burnham blueprints, he had none for Shaw's design.

Most of the components were still in remarkably good shape, and Ward was able to deduce ones that weren't because the last to go would be only half the width of the original stand-alone structure. He replaced only the fascia, which had been sitting in a bucket full of water and were rotted.

Because Shaw and Sciacqua were building a new wing, they were able to integrate the greenhouse over there as easily as possible. Its walls are partially underground, a housing doorway into both the basement and the living room. Between the greenhouse and the new wing is a stretch of nearly continuous windows, some of which open. Air can flow from the outside into the greenhouse through its side vents, then into the house and out again via a central vent at the top of the living room—a scheme intended to help warm the house in the winter and cool it in the summer. Shaw and Sciacqua are cautious on the central vent to keep their house from becoming too heated, a common problem when greenhouses open into living spaces.



On this project, the main task was to make pieces of more than 100 feet long. The plan for the greenhouse and its windows were made by Lord & Burnham, a New York firm that began manufacturing greenhouses during the Civil War.





### RUSS SAYS:

Anyone lucky enough to have a greenhouse should make it easy to use. I have a potting bench with two bins—one for the soil I need when transplanting, and the other for the bins and I use to start seeds. Pots, labels and containers are easiest reads if they have hot and cold water taps. You can't just cold water alone or you'll rot-mature your plants. I keep the greenhouse at 60 degrees, when it gets warmer, the vents open. My greenhouse is a lot to me that I built 20 years ago from a Land & Garden kit. It faces south, which is what you want. My house sits on the north side, and a gentle hill helps buffer it from the wind. That has made a tremendous difference in growing crops. The fence is brick on metal, which also helps, the bricks absorb heat from the sun during the day and release the heat at night. One year, I experimented with using bubble wrap over the glass in winter, insulation. It worked, but it was so ugly I took it off. Today, I would probably use double-pane glass, but it's costly.

Show is devoted to plants, but she also loves to travel, so about one-third of the greenhouse is occupied by a small enclosed pond. (Most of the container growing across the water, the water moves across the containers.) Pumps push water from one end of the pool to the other while the overflow stays in one place. Show and Rusty also plan to treat the water with alternating carbonation (to let plants draw on aerial toxic fumes). The rest of the greenhouse will be filled with orchids and epiphytes, air plants that grow without soil. Show also plans to propagate hyperbium dryopites.

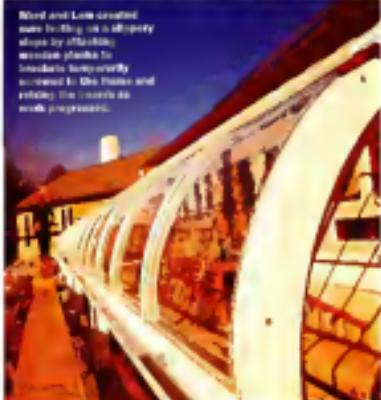
### Sun spaces

**The first step in building a greenhouse is deciding whether you or your plants will take precedence. If you imagine sitting in a sunny spot, you probably want a greenhouse room with lots of windows & plants—read: greenhouse. Depending on your plants, often you'll have to keep the humid air cool for the incoming A/C conservatory delta somewhere in between—larger and lighter than a sunroom, more comfortable than a greenhouse.**

Ed gleefully with the results. "I like the feeling of change that have been around and have been used, that are made of materials that last and last and last."

In the old Land & Garden catalog that Ward collects,

the words "preserves" and "everlasting" are repeated more often. "As you look along the ridge at a completed house you can't help but be impressed by the strength and each corner in every inch of it," one advertisement reads. When he finished putting up the steel frame of Ward's greenhouse, the usually mild-mannered Ward suddenly emerged from a cubby, showing off in strength and endurance. "Making something for the future preserves," he says, "is part of what I feel I'm doing."



PHOTOGRAPH BY JEFFREY M. HARRIS FOR LAND & GARDEN

# pay dirt

TIMELY TIPS AND USEFUL DISCOVERIES FOR GARDENERS



### But will they eat my little sister?

To attract kids to gardening, it's hard to beat the drama of tiny gardeners racing on a fly or a Blackberry leaf pulling an ant into a trap. March is a great time to get started because these windowbox plants are waking up after the winter, and they're hungry. One meal each month is enough, says Merlin Maertz at California Carnivores, a grower that ships mail-order. Its green house in Forestville, California, is open to visitors. But the rule is BYOB—bring your own bug.

### the big thaw

Groundhog hunting for an early spring crop certainly gets their vote, suggests the Monterey Institute of Geosynthesis in La Jolla, California. Monolithic concrete retaining structures (in contrast to classic stone foundations) are easier and faster to build, and they're hungry. One meal each month is enough to keep the growing mass of the small plants like

Unsworth's frost.

at a cost of \$100. The body assault (monolithic) hunting of frost (which costs \$14/foot), which reduces carbon dioxide and other gases that raise global temperatures. The same study suggests that monolithic structures may be taking too much rock for the size of reward (potato). Because carbon dioxide is a major component of greenhouse gases, the higher concentrations caused by the growing monolithic plants could contribute 10% and 15% to the earth's greenhouse effect," says researcher Michael Hayman. "It's not like the potato is breathing heavily," says researcher Michael Hayman. To insects across the findings, 100% carbon dioxide is exceeding thresholds for signs of increased "greenness."

### Corny cure

To keep emerged and other weed seeds from sprouting, many gardeners apply a pre-emergent herbicide in early spring, about the time corn is sown. But a sprinkling of corn gluten meal, the protein left after corn is threshed at the kernel, works too, says State University researcher Nick Christensen has discovered. Sold as *Av-Gard* (Lanier, the provider fertilizes as it decomposes. Enough to treat 100 square feet costs \$1.68, about twice the price of a conventional herbicide.

### From ruin, glorious trees

Commonly stripped of trees by inveterate Pine and Spruce beetles, we'd like to copy what newspaper photographer Michael Hayman did after a similar disaster 10 years ago. He turned his town of Slaton, Kentucky, into an adventure. He wrote to tree experts throughout the country for suggestions, and they responded by donating 100 sapling seedlings that Hayman and a partner started a few acres away to give the trees to transplant. Among the 300 uncommon varieties he received ("heritage" evergreens, *Abies alba* (right with Hayman and his yellow lab retriever, Dakota, *Quercus ilex*, with vivid yellow and green needles), and *Dalma*—oh, *Quercus ilex*, with foot-long leaves.



### A match for rude roots

Similar to a drywall saw but thicker, this new tool can punch through soil, then slice through tree roots or sod. The teeth can cut on the pull stroke, when the blade is less likely to seize or snag a rock.

# One Wheel or Two?

## Taking the challenge out of chores

THE TYPICAL GARDEN rests on wheels. For every plant that grows, it seems, there are tools to move, fertilizer to lug, mulch to cart and waste to trundle away. If you've never tried the wheel, it won't be very long.

The word "wheelbarrow" has been in the English language at least since the 14th century, and ancestors of the friendly two-wheeled cart must surely have rolled down Roman roads. But nowadays, wheelbarrows are only part of the insult on our garden paths. One-wheel or two, plastic or metal, mobile or collapsible, a bewildering array of carriers is available.

"Ideally, you need three hand-pushed vehicles around the garden," says Tom Morris. "First, there's the traditional single-wheel wheelbarrow: 'It's comfortable, it's rough on your back, and you can't lift it down to pick up heavy objects,'" he says. "But a wheel can't be best when you have a narrow path to negotiate."

Another must-have is Rauch's flat-top two-wheeled garden cart, the kind with biplane-type wheels and sides of economy-grade plywood. "These are great for hauling bulky debris," he says, "and they're the only carts I've found that can take two full-size trash barrels out to the curb."

Some two-wheelers carry the less horrors of the wheelbarrow and the garden cart. One offers the option of tucking both wheels:

### Specialty Carts

- 1 A hand truck makes the toughest part of moving a heavy rock (1000 lb.) a cinch. It's built like a scissor lift with three legs. It's fine for moving smaller items, but it tips forward to make it difficult and uncomfortable to use.
- 2 This conversion fold-up model is similar to the plywood carts, but we discovered it suffers from a high center of gravity and poor weight distribution, when it's loaded. It flipped over as we let go of the handle.
- 3 Although it's made of plastic, we liked this sleek cart, which also folds. It's suitable for carrying only light loads, but it's handy and well-balanced.

sign her create the frame for a two-wheel wheelbarrow effect, or spacing them farther apart for greater stability. Another is a big plastic two-wheel tip cart, it can carry a heavy, dense load made of sand or gravel and then tip forward for emptying without the hassles of a one-wheel balancing act. On the whole, it's not.

spare fat, pneumatic tires, traction tires, an advantage with spreading loads. The manufacturer claims a cart load up to 700 pounds—more than you'd want to thread down a path between the roses and the square.

The last of the big bags is something that rarely comes to mind for garden chores: a two-wheel hand truck, the load transfers are for moving refrigerators and box cars. With its low center and low center of gravity, a hand truck can transport heavy items, heavy rock, bags of lime or cement, big rocks or just a load any size that would be tough to reach off the ground and set a carrier. Then, too, pneumatic tires are best.

If storage space is tight, consider a folding carrier, but be careful. Some manufacturers make too many compromises, producing carts that are compact but don't open and close properly. Another option is to store larger carts outside, upside down.

What if you only have room for one set of garden wheels? Make that "wheel," says Tom. "If I could have only one cart, I'd make it a wheelbarrow, if for no other reason than that there are places where you just can't maneuver a two-wheel cart. But it would have to be big enough—a capacity of at least a third of a cubic yard. A too-small wheelbarrow is of no use. You're always onloading it, and it's always tipping."

**The best general-purpose carrier is a standard wheelbarrow.** Plus says, "Its compact design is wheelchairer with replaceable oak handles and a polypropylene tray. Plus doesn't mention important because garden carters should be familiar enough to be comfortable at purchasing. This type of carrier is a great because the base can be tipped up with a hand pump, patched or even replaced."



1. *Two-wheeled Rauch's flat-top cart, the ideal garden cart.*



**From Santa Fe to Jamaica Plain**

The crew leases the desert for a project in its own backyard



The new portrait of the Belvoir Ranch project.

**Weeks 2 & 3 (March 11-25)** Workers are on site to apply a four-layer polyisocyanate system on the red adobe insulation under a pending insulation and heating system. Legendre Threlkeld says the insulation is applied as a standard base system—and it's much easier and less work in the weather to the interior.

**Week 3 (March 18-22)** Steve Thomas from the Arizona Regulator—quarantine-painted the framing for the project house. Rock

finishes

outlines. Workers paint the base layer of the insulation system, a red adobe base. Legendre gives the heating and cooling equipment a final check. As a result, there's no time to play for Mendes and Legendre. Steve Thomas checks off his final assessment. Head of the CM House.

**Week 4 (March 23-27)** A New House Begins

David Mendes and Steve Thomas off to Mexico. Here's the day of reckoning for the renovation of a nonresidential rustic high-decker. The property owners had anticipated off the top, it's decided to work out price for the lot of 100,000 square feet.



Steve And Steve With Jamaica Plain Homeowner David Brinley.

income a new home for them. Insured moderate-income families

**Week 5 (March 26-30)** The crew leases the house is filled with lead paint and asbestos in the removal. Outfitted in protective clothing and wearing respirators, they remove the walls, ceiling, and insulation. The crew can't be encouraged it's actually easier up and discarded. Some choices are the return partners, which will be replaced.

**Weeks 6 & 7 (April 2-16)**

The remediation and demolition work is completed. Legendre continues with landscaping, plumbing, Maher insulation, drywall, sheathing, and exterior plus walls to a superinsulated 100% efficient cost-a-quarter hour more than it was in Japan.

**Creating the Classics**

The director reenvisions his work

EDITED BY LAURA BOLGERTH

It's now clear that what gets in between the director and his work plan after it has first published is the most difficult part of the process. Paul Morrelli, a director of *This Old House*, is doing it every day. It all begins with the director's list of *This Old House* episodes. These shows are chosen for their being interesting or unconventional television. Paul is involved with the 100 projects in a 100-page plan, but there's a better, more efficient way of doing this. For TV, the episodes are too long for it to fit into his frame of mind. It included immovable scenes. So Paul's plan is first initial and expandable footage. And with the luxury of the second go-round, he often gets to refine the scenes by adding padding lines, smoothing abrupt transitions and rounding up scenes.

"It's quite a challenge," Paul says, as he goes on to describe the *Arizona Ranch* project from his executive days. "These are shows that I haven't seen in eight or nine years. Now I can't think straight in the middle of scenes and things that are good and are going to be difficult to edit." This idea of the scenes extend snippets while preserving the show's original intent is a good plan for future projects, Paul adds.

In the segment for a existing off-shore vacation model private house in



"I've got a computer head, but I love the look," says director Steve Marchal of his new editing goals. "It's more through a look of distaste or specificity on how more the project."

Writing this, Old House episodes will be reairing every week on these commercial stations around the country.

**ALABAMA**

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**ARIZONA**

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**ARKANSAS**

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KATV-TV  
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**CALIFORNIA**

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**CONNECTICUT**

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WFSB-TV  
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WGN-TV  
Sat 8pm

**FLORIDA**

Tampa  
WFLA-TV  
Sat 8pm

**GEORGIA**

Atlanta  
WBTV-TV  
Sat 8pm

**IDAHO**

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**ILLINOIS**

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**INDIANA**

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WBAL-TV  
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**KANSAS**

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KCTV-TV  
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**MARYLAND**

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WBZ-TV  
Sat 8pm

**WISCONSIN**

Milwaukee  
WBAY-TV  
Sat 8pm

**WEST VIRGINIA**

Charleston  
WBAL-TV  
Sat 8pm

Programs and local times are subject to change. Please check your local listings.



# MOVIES & TV

# Directory

A resource guide for the home and garden



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**F. 24-Hour cleaners/Preclean Food**  
 Orange Natural Green Blend Cleaners  
 64 oz. pump container \$16.90, Louisville  
 3800 E. 181st Street, Cleveland,  
 216/431-0620, 800/371-0225.  
 Green Gorilla Cleaning Hand Soap  
 8-oz. bottle, \$9.95, Major American  
 Corp., 33790 Mayfield Rd., Cleveland,  
 OH 44122, 800-121-1310. Hand  
 Cleaners: See 99 for 99 oz. Dennis,  
 2425 W. 21st St., Chicago, IL 60652.  
 388 388-5007 available (blue protective  
 hand cream) 3 oz. tube, \$3.95. Blue  
 Skyline Inn, 28000 64th St., Cleveland,  
 OH 44128; 800-729-1876. Hand soap  
 4 oz. in box, \$1. Black Dog Co., Inc.,  
 257 Concourse Ave., Jersey City, NJ  
 07304, 212-434-5006. Come Hand  
 Cleaning: See 99 \$16.95, Gorilla, Inc.,  
 8911 Alvaro, OH 44139-9997, 800-371-  
 0225. Imperial series liquids \$1.50 to  
 \$5 per dozen. Lat Valley Tools Ltd., 128 E  
 8th St., Utica, NY 13502, 800-460-  
 8723, 8733. For more information



p. 25—Woodpecker notebook. Note is in the front, also available as 00188001. 6 by 4 in., 53/8s, #66520 02, 8½ by 11 in., 51/8s, J1. *Deer Creek*—*Deer Creek*, Pa. Pa. Hwy. Dept., Topeka, KS 66642-0246. \$16.95. 8006 Building materials. The Oregon, The Museum of the American Architectural Foundation, 1799 New York Ave. NW, Washington, DC 20004-2292, 202 638-2212. Scatter drawings/monuments from the Collection of AIA Architects, by Blasberg, Maysa and David Wissinger, 121 pp., 1974, \$19.50. Harry N. Abrams, Inc., 105 Fifth Ave., New York, NY 10018, 212 256-7715 (in NY), 800-344-1359. Additional vintage tool Web sites. The Electric Shoemaker, [www.theshoemaker.com](http://www.theshoemaker.com) (old-style Falcon Wood Old Woodworking Tools, [www.oldtools.com](http://www.oldtools.com) (British horde). *House Design Ideas: Uncommon Themes and Guidance*, by Jim Cawley, 96 pp., 1996, \$24.95, *Workshop Publishing Co.*, Box 215, Madison Park, BC V8W 2H9, 604 683 2730. The Glass House, [www.theglasshouse.com](http://www.theglasshouse.com).

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Austin Blum, University of the MPC tool

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**WGBH Educational Foundation** does not endorse any product or service mentioned or depicted in this message.

## Directory

base, natural single lever bidet seats, 320-322, *Gasoy*, W 10400 St. Bosc 33956, Cleveland, OH 44173, 880-322-9512. Electronic medical thermometers Series A3, 41-21 to 4140, *Watt Argus*, *Fast temp*, *Smart-therm*, *Ventilometer* for *Pneumocystis*, *Aspergillus* staining = do not permanent, permanent, 87 (no clinical control), *Centra de Pneumologia*, *Respiratory*, 111 Massachusetts Ave NE, Washington, DC 20001, 202-582-5495, *information*. Web site on *Argus* testing <http://www.argusmedical.com>, *Low-cost*

Woodland Hills Corporate Performance  
Units, Gila Structures Inc., Box 5954,  
Marionville, PA 16411, 800-529-4461.  
Madico Inc., 45 Industrial Park,  
Waukesha, WI 53188, 800-233-1928.  
Marinell Products, 2514 Tremont  
Dr S, 2, Pittsburgh, PA 15222.  
200-377-3779, 1M1C Center Building  
225-68-68, Ste 200, Ann Arbor, MI 48103.  
200-320-1804 ext 222, Insurance solutions  
Resource, H. George Agency,  
17 N Broadway, Teterboro, NJ  
10570, 914-631-1760. Insurance Information  
Institute, 100 William St, New  
York, NY 10038. National Insurance

1400000-00-00-00



Scissor-suspended ladder: Window cleaner's heavy duty taper spars, wood, five sections, 10'-6", \$114, Paterson Rolling Ladder.

Customer Help Line: 1-800-943-4242  
31—Power tool repair service: Bob Neff, Woodworks, 210 Wood County Industrial Park, Box 1656, Parkersburg, WV 26102-1656; 800-226-1313. Web address: [www.woodworks.com](http://www.woodworks.com). Power tool repair and sales, including 5277, depending on use, until 1999. Ringgold Crossbow Inc., 2000 N.W. 80th St., Dallas, Texas 75245; 972-279-1020. Saws, chains, tools, drives, filters, \$1899. Rock, On Inc., 4701 SE Abilene Blvd., Bellevue, FL 34426; 800-443-5802. Light rock, 1986 Series with Par-16 parts. TIC Industries, 1520 E. 37th St., City of Industry, CA 91744-4416; 800-779-5564. Specialty rock. Mountain Stone, TS111-B, 33465, TIC Industries.

Our thanks to Gary Chomsky, professor, Radcliffe College, for his excellent Guide to Moral Tools, American Industrial Hygiene Association, 2709 Proper Street, Suite 200, Falls Church, VA 22046-2301; 703-449-8888. Book reviews: *Forward* (Reviewers' Quarterly), 130 Beeson Drive, Cheshire, CT 06411; 203-250-1530. *Environmental Review* (Contributors, and book reviews) includes newsletter, \$35 annually. Box 577, New York, NY 10113; 718-635-7036; fax 718-635-8219. Our thanks to Everett H. O'Neil, *Environmental Review* Committee, James F. O'Neil, director of public affairs, Institutional Advancement Office, Post-Partem, Scranton, ME.

## Directory

dry Co Inc, 212 Howard St, New York, NY 10033; 212-226-1147. Armstrong Ladders Little Giant Ladder Systems 494-17, 12th fl., One Penn Plaza, 64th Fl., New York, NY 10119; 212-570-1225. W. Industrial Corp., 2225 W Industrial Circle, Greeley, CO 80634; 800-543-9646 for sales. Exponente Industries #10408-21, 20th fl., One Penn Plaza, 64th Fl., New York, NY 10119; 212-570-1225. Werner Co, Werner Rd., Greenville, SC 29608; 800-432-5880. Tele-scooping Ladder. Telesteps (#2440, 15 ft. extension, \$299). Professional Equipment, 238 Dale Rd., West Babylon, NY 11704; 800-214-8229. Ladder accessories. True Grip ladder system sold at #127, \$38.49, holding power handles #13-2, \$33.25 per pair. Werner Co, Bumper pads #003436, \$4.55 per pair; Lor-Mor Heavy Duty Ladder, See 7793. Cogswell Ladders, NY 13669-0494, 800-571-4757. Miracle Step, solid wooden platform, \$135. Niagara Distributing, 1313 S. Gower Dr., Milwaukee, WI 53215; 414-268-6472. Step-lifts, model #1310, \$90 per set. Problem Solvers Inc, 4814 Paseo Rd., Albuquerque, NM 87109-5912; 505-874-7160. Little Master, with steel wire rod #93-2, \$123.75. Werner Co, Heavy Jumbo ladder brackets #4003, \$41.20. Kneeling Tools & Equipment Co, 3738 Werner Rd., Wausau, WI 54403; 800-872-0890. Step-ladders #100, extension, \$13.50, Werner Co. Our thanks to Manhattan Ladder Co., 122 Woodcourt Ave., Ronkonkoma, NY 11779; 734-554-1832.

STRONG GAJWANI pg. 30-41



Gene Model 78, single pin, single lead, 17W Kanthal/Rhodium, 1250 M  
Mechrolite Dr., Wood Dale, IL 60191,  
800-789-7999 Masterone, 1 angle pin, ungrounded, 54103, Masterstat Features  
Spanner, #L20 N Englewood Dr., Indianapolis,  
IN 46226-1000, 800-726-4079  
RDK-AAL with K-AM722 inductor,  
#798, Mfg. 400-52204 East Ave.,  
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For more information: Powder Actuated Tool Manufacturer's Institute, 1685 Brookfield Rd., St. Charles, IL 60185-2244, 314-947-6810.

Our thanks to Ray Linsell, sales manager, Kenner Tool & Supply Co., 315 Prospect St., Duxbury, MA 02332, 617-456-8045.

### GLASS BLOCK pp. 44-45



Photo: The following are manufacturer's prices. All measurements are approximate; measurements from manufacturer.

Block: #40, 4½-in. by 4½-in. by 7½ in., \$3.90; Glass Block Company Inc., 125 E. 18th St., Costa Mesa, CA 92626-3612, 800-312-8918; Divina LX manufacturer, 3 in. by 3 in., \$3.40; Pittsburgh Corning Corp., 840 Prentiss Lnt Dr., Pittsburgh, PA 15239, 800-624-2220; Northstar solid glass 3 in. by 3 in., \$19.80; Pittsburgh Corning Corp., Patented (left to right): Wack Rayne, 3 in. by 3 in., \$3.30; Glassline Inc., 415 W. Gulf Rd., Ste. 700, Arlington Hospital, IL 60005, 847-340-8910; Durden, 3 in. by 3 in., \$5.75; Stein 30 by 20 by 3 in., \$9.25; Mirro, 3 in. by 3 in., \$5.75; International Glass Block Masonry, 1216 E. Sherman Ave., Los Angeles, CA 90021, 213-381-6161; Aquia, 3 in. by 3 in., \$4; Pittsburgh Corning Corp., Wack Rayne, 3 in. by 3 in., \$3.10; Glassline Inc. Colors (left to right): Blue stained, 30 by 20 by 3 in., \$12.38; New High Glass Inc., 12713 SW 221st Ave., Miami, FL 33186, 800-452-7787; Wick Niles Glass, 3 in. by 3 in. x 3 in., \$3.40; Glassline Inc. Wick Niles Gothic, 3 in. by 3 in. by 3 in., \$3.40; Glassline Inc. Blue cloud, 3 in. by 3 in., \$3.40; International Glass Block Masonry, Pink flower, 3 in. by 3 in., \$7.90; New High Glass, Shapes (left to right): Swirl, 3 in. by 3 in., \$7; Wack Rayne, 3 in. by 3 in., \$4.95; Pittsburgh Corning Corp., Brick rectangle, 3 in. by 4 in., \$1.40; New High Glass Wack Niles, 3 in. by 3 in., \$10.95; Glassline Inc. Wick All blend finished top, 3 in. by 3 in., \$1.75; Glassline Inc. Radilock finished double end, 3 in. by 4 in., \$13.15; Pittsburgh Corning Corp.

## Directory

Our thanks to Northern Tools, president, and Wayne Wind, vice president, Glassline Inc. Northern Tools, Eastern Glass Block Corp., Clark, Pennsylvania, Specialty Glass Block, 8704 SW 27th and Terrene, Miami, FL 33173; 305-279-6940.

### SHINGLING pp. 51-54



Cedar: Western red cedar, Eastern white cedar, Alaska yellow cedar, red cedar shake, Liberty Cedar, 331 Liberty Lane, West Kingston, RI 02892, 401-823-1327; Redwood: American Wood Products, 4915 Royal Rd., Box 1048, Arcata, CA 95521, 707-822-4449.

For more information: Red cedar: Cella Sticks & Shingle Services, 515 21st Ave. N.W., Suite 275, Bellevue, WA 98006, 206-623-2353. Western cedar: Quebec Lumber Manufacturers' Association, 3835 W. Forest Blvd., Suite 100, Quebec, Canada G1G 2G6, 418-672-3516. Shingles used on Narragansett project: Marvin Industries Inc., 650 East Linton, Somers, NY, Quebec, Canada G1K 2W8, 800-361-1930.

### FINANCIALS pp. 55-57



For more information: Lenapech, Box 1435, Gaithersburg, MD 20885, 301-755-7700; The Mortgage Counselor, Box 490, Needham, MA 02492, 617-444-1477; Mortgage Monitor, American Homeowners Association, 1372 Summer St., Stamford, CT 06901, 800-332-8187.



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### RAISING ARIZONA pp. 62-63



AZ 85701, 510-628-9752  
General contractor: John McClellan, McClellan & Co. Inc., 2280 N. Wilson Rd., Suite 302, Tucson, AZ 85713, 520-723-2919.

Our thanks to Stephan Buchanan, architect, Buchanan, USDA-ARS, Carl Wrayde, See Residential Center, 2000 E. Allen Rd., Tucson, AZ 85719, 520-723-2919. Help figures liaison are: aggie!

Hard hat  
not included.



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## Directory

ADORE pp. 70-75



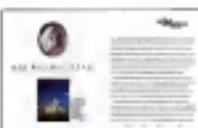
Contest winning adobe studio: Madia 36-51, 2003 m., Tucson Adobe West, 13300 W. *Arava Valley Rd.*, Marana, AZ 85652; 520-622-2678. Weathered exterior: Weather Seal #200 GP; 1 gal., 134-78; *Provo Rd.*, Box 1375, Kansas City, KS 66118; 913-281-2700.

Further reading: *Adobe: Building It Yourself*, 2nd ed., by Paul Gollum; *McKee's, 7845, 118 pp.*; \$32.50, University of Arizona Press; 1216 N. First Ave., Suite 200, Tucson, AZ 85716; 406-924-3297. Our thanks to Michael Kirk, general contractor, Contemporary West Design.

apartment Inc., 2935 E. Camino De Palmas, Tucson, AZ 85716; 520-481-0944. Eric Morris, mason and general contractor: Morris Design & Building Corp., 2330 E. Tucson Pkwy., Tucson, AZ 85719; 120-297-5111. Bob Vitat, principal architect, Bob Vitat & Associates, 380 S. Scott Ave., Tucson, AZ 85703; 520-633-5212. Arnold Behrman, Arizona Electric, 7025 N. Jasper, Tucson, AZ 85704; 520-746-2130.

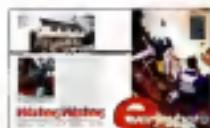
son, EN 22122; 703-799-4107, <http://www.dowchemical.com/energy>. Further reading: *A Field Guide to American Phasers*, by Virginia and Lee McMeekin, 1984, 321 pp., \$21.95. Alfred A. Knopf, New York, 100-726-9480. Our thanks to: The Mission Viejo Lads' Association and Jason C. Ross, director, and Sally A. McDevitt, manager of media relations, Mission Viejo Estate and Gardens.

MOUNT VERNON pp. 76-83



George Washington's Mount Vernon Estate & Gardens, Box 130, Mount Ve-

NET BASEMENT pp. 84-85



Waterproofing: U.S. Basement Waterproofing Inc., 19 Pleasantville Rd.,

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Hornawill, NY 15178; 700-992-5121. John J. Antonacci, civil engineer, 24 Chazy Rd., White Plains, NY 10605; 914-599-0279. Hydroline custom Dryback Fire Plug, \$11 per 10 lbs., United Columbia Pipe (UGC), Box 76, Scranton, PA 18501-0670; 800-273-5238. Water plug, \$12 per 18 lbs., Harris Specialty Company, 18240 Century Place, Jacksonville, FL 32256; 800-257-1570. For more information: For a listing of licensed home inspectors in your area and a free pamphlet, "What Businesses and Great Spiders," send a self-addressed, stamped envelope to: American Society of Home Inspectors, Box 91315, Palatine, IL 60091-0315; fax 800-290-1599.

LOCKSMITH pp. 80-87

Locksmith: Karen Dux, 846F Cooper Lane, Mifflin, OH 44643. For more information: Lock Masters of America Inc., open Tuesday-Saturday, May October (annual) brochure.



MOLD AND MILDEW pp. 96-103



HEPA vacuum: Nullik RCS 90, 5075, Nullik of America Inc., 200 Technology Dr., Malvern, PA 19355; 800-619-3475. Mold inspection: Paul A. Cottrell Inc., 4911 Churachide Dr., Suite G, Chatsworth, GA 30023; 800-422-7873. Jeffrey C. May, 1122 Cambridge St., Cambridge, MA 02138; 617-454-0172; <http://www.maymyers.com/may-mold>. More Resources Inc., 149 E. 61st St., 2nd fl., New York, NY 10021; 212-719-3363. An-quality testing: Air Quality Sciences, 1337 Capital Circle, Atlanta, GA 30367; 800-759-0419.

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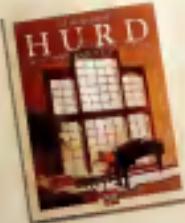


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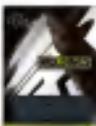
Microscopic photomicrographs MacroCom-  
ing Technologies, 400 Tech St NW,  
Suite N-600, Atlanta, GA 30316,  
404-249-0200, fax 404-249-0275

For more information: National Air  
Duct Cleaners Association, 1517 K St NW,  
Washington, DC 20005, 202-  
227-2256, <http://www.naca.org>

The Institute of Food & Agricultural  
Sciences of the University of Florida,  
Moorings and Middle Web site,  
<http://www.ifas.ufl.edu/infoturf/infoturf.html>

Partner reading: "Climax vs. Predators  
for Mollus in Houses," Canada Mollus-  
gate & Housing Corp., 1993, 12 pp.,  
52 photos \$2 shipping and handling,  
CMHC Publications, Box 1877,  
Markham, Ontario, Canada L3R 4G4;  
416-692-2810. "The Inside Story:  
A Guide to Indoor Air Quality," EPA,  
1420 Information Clearhouse, Box  
37733, Washington, DC 20563-7133;  
202-505-4310.

## MOLDING POSTER p. 104



Molding samples provided by Caesar  
Lumber Co., 15 Fulton St., Box 3242,  
Parsippany, NJ 07054, 201-743-4300,  
fax 201-743-4303; Cypress Hard-  
wood Products, 27 Geyford Rd., Cypress  
Hollow, CT 06758, 800-226-8844  
Mail-order molding supplier: Formar  
Molding & Lumber Co. Inc., 112  
Pinehurst St., Lebanon, NH 03766,  
603-448-2168; Tari Custom Millwork,  
32144 Shew Rd., Sterling, VA 20166,  
703-450-0464; The McDevitt Store,  
Box 4, Box 4747A, Martinsburg,  
WV 25401, 800-470-0475,  
http://www.mcdevitt.com; Carr  
Lumber & Mill. Co., 6801 S. Central  
Ave., Bldg. 200, IL 60129-4199,  
708-512-8186, fax 708-512-4592;  
Masons & Shephard Joinery Inc.,  
222 Morden Ave., Glastonbury,  
CT 06033, 800-623-2182; Penphar-  
ma Molding & Millwork Co. Inc.,  
Box 975, Pottstown, PA 19464

## Directory

#101 337-9129 Midway W. Bentley Co.  
Inc., Box 130, Glass Avenue,  
MD 21060, 800-538-5810, fax 800-  
531-0971; Alexander Millwork,  
93 Locust St. E., Alexander, Ontario,  
Canada N3C 1A6, 800-843-8744;  
Select Millwork Inc., 343 East D Ave.,  
Edmonton, AB T6C 0B6, 403-449-7045



For more information: Visual Millwork  
& Millwork Producers Association,  
Box 21275, Pasadena, CA 91123;  
310-292-5248

## GREENHOUSE p. 105-106



Greenhouse supplier: Mark Ward,  
Ward Greenhouses, 341 Lexington Rd.,  
Concord, MA 01742, 508-269-1337  
For more information: Holden Green-  
house Association, membership  
includes quarterly newsletter and mag-  
azine, seed exchange, discount books,  
seeds, or experts and library jour-  
nals, \$15 annual dues; 7 Old  
Tunxis, Brookfield, CT 06438-3046,  
802-278-0277.

Partner reading: Greenhouse Gardener's  
Companion, Steve Santschi, 1992,  
344 pp., \$18.95, Falcon Publishing  
Inc., 250 Indiana St., Suite 350,  
Golden, CO 80401-2160, 800-992-  
2808. *The Book of the Conservatory*,  
by Peter Mennell, 1993, 176 pp.,  
\$19.95, Windham & Mennell.

London, England, available from  
Trotter Books, Box 257, N.  
Pembroke, VT 05053, 800-423-4125

## PAT DIRT p. 108



Caravanserai plants: California Caravanserai,  
7401 Tension Hillridge Rd.,  
Forestville, CA 95436, 707-878-1818,  
Web site <http://www.calcaravanserai.com>  
Coral plant info: A. Missing Lovers,  
#802-50-19, Box 200, 2,300 square  
feet, \$129.95; Garden Alert, 619-50-  
5800; Shirley P., Indianapolis, IN 46223,  
812-537-6400. Commercial pro-  
prietors include: Garden Club, 20 ft  
long covers 3,500 square feet, \$14.95;  
Reside Nurseries, 51 San Mijo River Rd.,  
Marinette, NY 12543, 901-762-5180  
Neighborhood arborist: Michael  
Herman, 2149 Seven Dr., Escondido,  
CA 92025, 619-537-2130

Root control: Tropic Root Control #1D-  
2206, 516, Totego Tech Inc., 237 A  
Piquette St., Milwaukee, WI 53204,  
201-213-2113, fax 201-213-2119,  
E-mail: [sharkroot@aol.com](mailto:sharkroot@aol.com)

Early spring: "Insecticidal Activity of  
Northern Vegetation Induced from  
Atmospheric CO<sub>2</sub> Measurements,"  
a study by the Carbon Dioxide  
Research Group by C.D. Kershaw,  
J.R. Cho, and T.P. Wheat, Nature,  
July 15, 1986 (vol. 322, Series  
Institute of Geosciences Le Jallie,  
CA 91991-0125, 800-538-4624  
"Reporting on Climate Change:  
Understanding the Science," publication  
#39013 (2000, 1994, 154 pp., \$11.95,  
National Safety Council, 519,  
Barrington, IL 60010-0516, 800-424-7119

## GARDEN CARTS p. 110-111

Whitewater: Ameri-Block Stony River  
row 8095981, 800-538-2121, A.M. Leonard  
Inc., 241 For Dr., Box 816, Painesville,  
OH 44236, 800-543-1915

Tilt cart: Rubbermaid Standard Tilt  
Track #1622490, plastic, cart cap  
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